

IMPLICATIONS OF THE EMERGING
LAW OF THE SEA TO THE
U. S. NAVY

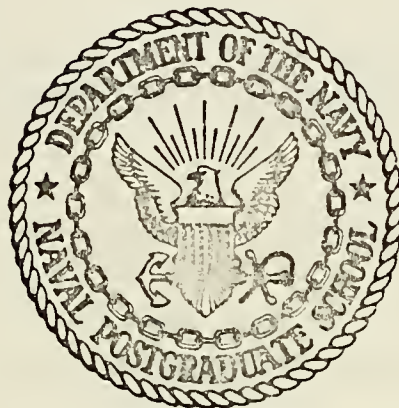
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THESIS

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U.S. NAVY

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ABSTRACT

Seven major issues in dispute at the United Nations Conference on the Law of the Sea and affecting the U.S. Navy are examined from the standpoints of Naval interests as well as the Nation and the international community. The issues are:

National security and peaceful use of the oceans,

The territorial sea,

International straits,

Marine resources,

Marine scientific research,

Marine pollution,

The international regime.

Solutions to the issues are argued and compared from the perspectives of the international community as a whole, the United States and the U.S. Navy. It is shown that the best solutions for both the United States and its naval force appear to be in the direction of greater international jurisdiction for the world's seas and, thus, the U.S. stands to gain the most from an effective and widely accepted international ocean regime. The roles of the U.S. Navy and other international navies as peacekeepers and marine managers supporting a new international ocean order are also explored.

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I. INTRODUCTION

The objectives of this thesis are to examine the complex problems and policy choices facing the United States Navy as a consequence of the emerging international Law of the Sea, while also satisfying the requirements for a degree of Master of Science in Oceanography.

Ocean problems are multifarious and their study necessarily interdisciplinary. The social, legal or political aspects of the regime of the sea cannot be separated from the physical characteristics of the oceans and the resources they contain. Experience and knowledge in a wide diversity of fields are useful to any exploration into these problems.

The writer has served aboard submarines and surface ships of the U.S. Navy and is a Naval aviator. He has studied for two years a curriculum in oceanography, has taken additional classes in international law and public policy and has conducted a personal survey of Law of the Sea literature. The Oceanographer of the Navy gave him the opportunity to attend international conferences on the use of the world ocean. As a result of that trip to Italy and Malta, the author had the opportunity to explore relevant issues at the Departments of State and Defense in Washington, D.C., at UNESCO in Paris and at the United Nations in Geneva and New York. As a result, the author is convinced of the increasing importance of a naval officer being as familiar with the international

legal regime of the oceans as he is with the International Rules of the Road.

It appears certain the the legal environment pertaining to the sea will undergo great changes in this decade, reshaping the legal order of the seas from the permissive, "laissez-faire" era of recent times to a more structured and regulatory age. This foreseeable change demands that the officer on the bridge or in the cockpit understand the legal framework and political atmosphere influencing their operations. A former Secretary of the Navy, W.B. Franke, has stated the challenge thusly:

Officers of the Armed Forces, and especially officers of the Navy, have long recognized that in addition to being professionals in the art of war they must be alert and responsive to the law of nations. The expansion and improvement of all forms of rapid communications plus the challenges to the freedom of the seas have made such knowledge increasingly important. The formation of the United Nations and the various collective defense organizations has also served to make the Naval Officer's life more international in character.

A knowledge of International Law and our country's dedication to its growth should be one of the ready tools of each and every Naval Officer [13 p. x].

In this thesis it is argued that the Navy has a definite role to play in formulating as well as implementing United States policies regarding the Law of the Sea. It is urged that both the advisory and operational roles be expanded. The author intends to demonstrate that the ocean policy issues critical to the Navy are frequently viewed too narrowly. The author's concern is that the U.S. Navy remain

effective through the adaptation to emerging technologies and public policies responsive to U.S. national interest and a new International Law of the Sea. The Navy will be better prepared for the future if the implications are considered for any of the likely outcomes of the international negotiations on the Law of the Sea.

The writer examines the range of possible solutions to seven issues critical to the U.S. Navy. The seven issues are: (1) National Security and peaceful use of the oceans, (2) the territorial sea, (3) international straits, (4) marine scientific research, (5) marine resources, (6) marine pollution, and (7) the international ocean regime. Each will be discussed in relation to its effect on the U.S. Navy in the foreseeable future.

Hopefully, then, this thesis will be of interest to any seafarer or student of seapower.

II. BACKGROUND

A. PRESENT INTERNATIONAL LAW OF THE SEA

The world's oceans had been considered free to all men and nations long before Hugo Grotius defended the concept in his work, Mare Liberum, in 1609 [25 p. 3]. This freedom has not infrequently resulted in conflict when one use of the sea interfered with another or a single use was over-exploited. Such conflicts usually resulted in new regulation of ocean use [29 p. 74].

After World War II the exploding technology and broadened perceptions of national interests regarding the use of ocean space soon stimulated the United Nations to undertake the task of updating the then existing and inadequate principle of freedom of the seas. Eight years of preparatory work and the convening of an international Conference on the Law of the Sea in 1958 resulted in four major conventions: (1) The Convention on the Territorial Sea and the Contiguous Zone; (2) The Convention on the High Seas; (3) The Convention on Fishing and Conservation of the Living Resources of the High Seas; and (4) The Convention of the Continental Shelf [13 pp. 343 to 378]. The participating nations failed, however, to agree then or at a follow-up Conference in 1960 on the specific width of the territorial sea, though it could not presumably exceed twelve nautical miles [13 p. 350 Article XXIII (2)].

The accelerating technological revolution and increasing growth of the international community required of the United Nations a new effort at reforming the laws of the sea. The United Nations General Assembly, beginning in 1967, adopted a series of resolutions looking towards a more structured order on the oceans. They included: Resolution 2340(XXII) of 1967 on the Peaceful Uses of the Seabed; Resolution 2467A (XXII) of 1968 on the Establishment of a Standing Seabed Committee; Resolution 2566(XXIV) of 1969 on Promoting Effective Measures for the Prevention and Control of Marine Pollution; Resolution 2580(XXIV) of 1969 on Coordination of Maritime Activities; Resolution 2749(XXV) of 1970 on a Declaration of Principles Governing the Seabed and the Ocean Floor and the Subsoil Thereof Beyond the Limits of National Jurisdiction; and Resolution 2750(XXV) of 1970 on the Peaceful Uses of the Seabed and Convening of a Conference on the Law of the Sea [75 pp. 499 to 513].

The Antarctic Treaty of 1959 [18 p. 182] and the Multilateral Treaty of 1967 on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies [13 p. 495] provided analogies for man's use of the world's oceans. Thus, in 1971 the international community concluded the Treaty Prohibiting the Emplacement of Nuclear and Other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil Thereof [13 p. 503]. This treaty, in effect, denuclearized the ocean floor beyond a twelve mile coastal

seabed zone [59 p. 264]. In addition to these declarations and treaties, there has been a myriad of international machinery established to coordinate the orderly use of the seas [75 p. 487].

From the past twenty eight years of evolution in the Law of the Sea, the international consensus of principle is clear: the oceans in the future should be for peaceful purposes and be considered as the "common heritage of mankind" [9 p. 2, 25 p. 122]. The application of these principles, still obscure, remains the task of the forthcoming Law of the Sea Conference.

B. PRESENT U.S. POLICY ON THE LAW OF THE SEA

The United States signed and ratified all four U.N. Conventions of 1958. It is a party to the Antarctic Treaty, the Outer Space Treaty and the Seabed Disarmament Treaty. It supports the above mentioned UN Resolutions and participates in all international organizations active in the marine sciences. Current national policies pursued by the United States for a new International Law of the Sea were set forth on 23 May 1970 in a statement issued by President Nixon:

Major elements of the President's policy are a proposal for a new treaty to insure the rational and equitable use of the resources of the seabeds, and international agreement on 12 nautical miles as the maximum extent of the territorial sea, on freedom of transit through and over international straits, and on preferential rights for coastal states regarding conservation and use of living resources of the high seas adjacent to their coasts [59 p. 304].

On August 3, 1970, the United States formally presented a Draft UN Convention on the International Seabeds Area to the United Nations Seabed Committee in Geneva. The draft treaty included an innovative concept.

It provides a 200 meter isobath seaward limit for the area of the seabeds under national jurisdiction. It places potentially vast seabeds resources beyond that limit under continuing international regulation. At the same time, it specifically assures that the revenues from the exploitation of such resources will be equitably divided among the community of nations with special emphasis on economic aid to the developing countries [58 p. 77].

Ambassador John R. Stevenson, head of the U.S. delegation to the UN Seabed Committee, elaborated upon U.S. policies in 1972. He stated that the U.S. supports the maximum freedom of scientific research. Further, the U.S. encourages the establishment of an international seabed organization with broad regulatory and emergency powers to prevent pollution while overseeing the exploitation of the international seabed through its licensing, inspection, regulatory and revenue collecting authority [66]. These policies were reiterated by the President in 1973 in a report to Congress. The President noted the application of the principle of "... compulsory third-party settlement of disputes to help reduce the potential for conflict" [57 p. 218]. It must be emphasized that these Executive policies cannot become law except through a treaty ratified by the President with the consent of the Senate. Traditionally, Congress has shown more concern for commercial interests than international,

economic and political considerations with respect to marine resources [25 p. 70].

These and future American policies ought to be based on the goal of utilizing the ocean for the best interests of the nation. Since these interests are numerous, often overlapping and sometimes conflicting, the first requirement is to identify the nation's long term objectives. One set of national objectives has been forwarded by a member of the President's Science Advisory Committee, Gordon MacDonald:

1. To use the sea to stabilize world order by providing for food and other natural resources, by preserving the seas as a source of recreation, and by using the seas to mount cooperative ventures with truly international objectives;
2. To promote the economic interest of the United States by providing the means and safeguards to profitable investments;
3. To use the seas in ways designed to maintain a nuclear deterrent;
4. To provide the capability of effectively deterring any Sino-Soviet attempts at enlarging their spheres of influence by subversion or wars of liberation [29 p. 193].

It might be argued that the latter two objectives may be less long term than the first two. However, this sort of perception is needed by those who formulate the maritime policies of the United States.

The policy formulators have included a great number of interest groups, both public (Figure 1) [20 pp. 228 and 248] and private. Foremost among these have been the Federal Departments of State, Defense and Interior and non-governmental associations in the oil, fishing and mineral industries.

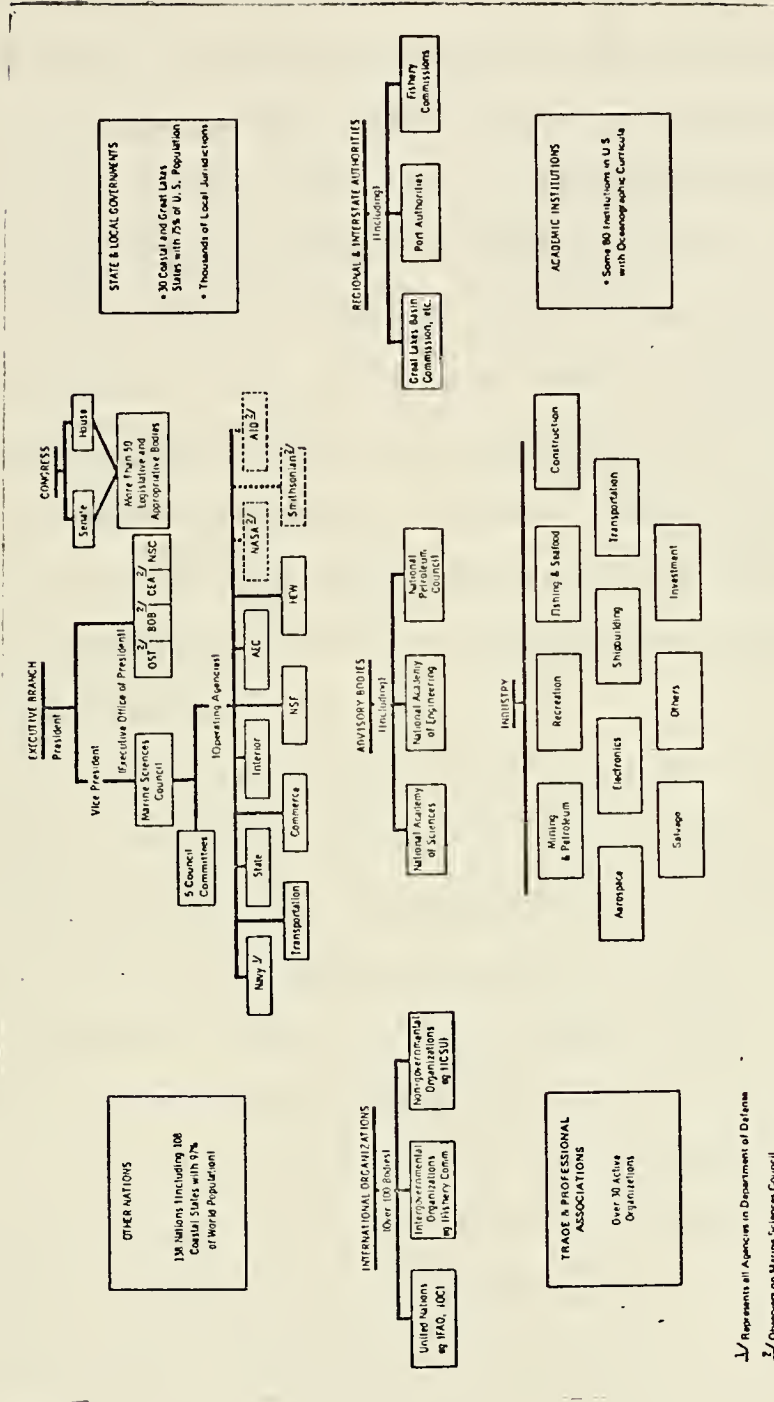


Figure 1. Major Participants in the Marine Sciences, [M.S.A. 3rd Report 1969, p. 198]

A governmental inter-agency Law of the Sea task force was able to produce a comprehensive set of recommendations that helped establish the United States Law of the Sea policies in the early 1970's. They were forwarded to the National Security Council for review, modification and approval by the President. A similar conflict and compromise among competing interests are expected to take place with varying decisions in every other sovereign state in the world.

The Department of Defense appears to have the most straight forward and singular motivation for its recommendations: the nation's security. Such a compelling cause has usually given the Department of Defense the prominent, if not always prevailing, voice in determining national Law of the Sea policies.

Since World War II national security has been recognized as being largely dependent upon world security or, at least, a number of regional security arrangements. The Department of Defense has been instrumental in articulating a regional approach to national security through NATO, SEATO, OAS, ANZUS and bilateral mutual defense pacts involving almost fifty countries [29 p. 174, 75 p. 12]. The co-participation of American and foreign armed forces in these alliances and international organizations has resulted in the United States' Department of Defense acquiring as transnational an approach to foreign policy as any other agency in the U.S. government. The Department of Defense, for example, is often in conflict

with the more national industry oriented Department of Interior on Law of the Sea issues.

Everyone is affected in some way by the laws pertaining to the use of the oceans and the governance of offshore resources. The way in which the U.S. Armed Forces conduct operations in peace or war is significantly influenced by the prevailing Law of the Sea. Obviously, the Navy is the service most affected. It has consequently played the leading role in formulating the Department of Defense's marine and ocean policies. Even in the negotiations, a naval officer is the senior military representative on the U.S. delegation to the United Nations Seabed Committee [60].

The next two sections examine the Law of the Sea problem as it relates specifically to the United States Navy.

III. THE LAW OF THE SEA PROBLEM AS IT PERTAINS TO THE US NAVY

A. THE ROLE OF THE US NAVY IN NATIONAL SECURITY

In order to appreciate the stake of the U.S. Navy in the emerging Law of the Sea, an understanding of its various roles is necessary. The Navy's most significant mission today is the maintenance of a seabased nuclear deterrent and retaliatory force, utilizing submarines and aircraft carriers. As approximate parity is reached between the strategic (nuclear) forces of the United States and Soviet Union, each nation will become more dependent upon its non-nuclear forces [57 p. 180]. Since nuclear deterrents have neither prevented nor suppressed limited war [29 p. 173], another role has regained importance for the Navy, that of providing a limited force deterrent and, when called upon, a counter to others' use of conventional forces.

Our present new era has been described as one "beyond peace and war" [7]. Limited, manageable force requires the ability to contribute to the achievement of national goals through the exercise of the least amount of necessary military force integrated with preferable political and other non-military measures. This approach implies a Navy with flexible and varied capabilities. Such a selective, controllable force suggests naval applications through small task forces off a coast, blockade, landing of an expeditionary force, off-shore bases, logistic support of a land battle or

general naval warfare between maritime powers [2 p. 81].

Herein lies the justification for the Navy's need for varied conventional capabilities: amphibious, minesweeping, logistic, anti-submarine warfare and sea control. The performance of these tasks require myriad craft, including the aircraft carrier [64 p. 149].

A third role of the Navy is diplomatic, a political-military capability to show the flag, demonstrate potential force or participate in international peacekeeping. United States naval bases and vessels provide tangible evidence of American power. They observe and, when necessary, enforce international rights in ocean waters. They strengthen the morale of allies and friends, while projecting America's capability to potential enemies [29 p. 126].

A fourth role is that of intelligence gathering and covert operations [29 p. 189].

A fifth role of the U.S. Navy is that of contributing to America's leadership in the marine sciences, particularly concerning the deep ocean [20 p. 7].

A sixth role, untried as yet, will be that of joining with others in the management and policing of the regulations of civil authorities. These last two roles will be discussed in detail in Section V.

The Navy's potential to fulfill these six roles has been supported to the maximum degree by the Commission on Marine Science, Engineering and Resources. "The Commission believes strongly that the nation's stake in the uses of the sea

requires a U.S. Navy capable of carrying out its national defense missions anywhere in the oceans, at any desired depth, at any time" [20 p. 3].

It is conceivable that the naval and/or maritime powers could try to collectively dictate a future order for the oceans agreeable to them alone. It is unlikely that they would be very successful because gunboat diplomacy has never for long obtained the desired results. Moreover, today's attitudes of mind, distribution of power and concepts of law virtually preclude such a course. Nevertheless, power, whether economic, political or military, is still a persuasive force in world affairs. Edmund A. Gullion has said:

Until a new international order emerges, and perhaps for sometime after, the rule of the seas will in the last analysis depend upon an international balance of power projected at sea by the world's warships, most of which are distributed among only two of the great maritime countries, the United States and the USSR [29 p. 11].

Five naval powers, the Americans, Russians, British, French and, possibly, the Chinese, operate virtually all the sea forces. Forty major trading nations [1 p. 17] possess the overwhelming majority of the world's ocean power. Yet, many observers believe that: "... in our times ... power has undergone a deep change ... in international politics" [16 p. 2]. Nuclear weapons cannot be sensibly employed as a counter to maritime influence, whether destroyers or fishing boats. Modern technology holds important implications for the narrowing of differences in power

between nations. Today, a patrol boat with missiles has become a credible threat to a guided missile cruiser.[2 p. 78]. Many forms of power have been dispersed and redistributed among nations since World War II. Nevertheless, Mahan's classic concepts of sea force are still valid. Moreover, seapower today requires a merchant marine, oceanography, marine research and ocean engineering [69 p. 50].

The United States has begun negotiations on a new Law of the Sea with over a hundred other sovereign states because none can afford to ignore the need for avoiding potential conflict and all may gain by establishing a global law governing the uses and abuses of the world ocean. Such objectives are in the best interest of all countries. The economic wealth and political power of the United States depend upon the assured use and non-abuse of ocean space.

The U.S. Navy is concerned with the Law of the Sea for two reasons. First, the Navy must protect the commercial, economic, scientific and political rights of the United States and its citizens under international law. Secondly, the Navy is aware that commercial, economic, scientific or political interest in the ocean may conflict with military usage. Given the power and diverse roles of the U.S. Navy, it is readily apparent that the United States has an enormous stake in any revamping of the Law of the Sea.

B. DIVIDING THE PROBLEM

The United States Navy may be affected by every issue arising from the Law of the Sea. Some issues, though, are

of more obvious or even critical concern to the Navy than others. This author has chosen seven major issues to discuss in this thesis that are, in his opinion, of greatest concern to the U.S. Navy. Selected from several sources [1 p. 17, 4 p. 2, 42 p. 23, 45 p. 322], these issues constitute for Law of the Sea experts a universal agenda and, therefore, convenient pigeonholes for purposes of their sorting and examination. However, this set of divisions is, in fact, artificial in the sense that all seven are interlocked. As with the interdependence of the seabed, the water column and the atmosphere, changes respecting any one issue affect all the others. Similarly, the investigation of any one issue tends to embrace the entire set of issues.

A brief definition and description of each issue is necessary before turning to a systematic examination of the major possible solutions to each issue.

1. National Security and Peaceful Use of the Oceans

This issue would seem to be the most relevant and challenging to the future of the U.S. Navy. The recent history of international relations might lead one to speculate about an eventual demilitarization of the entire ocean space. The Aaland Island Settlement and Spitsbergen Treaty of 1920 demilitarizing these strategic islands and the Antarctica Treaty of 1959 banning the latter's military use are both analogous to the oceans. The Outer Space Treaty of 1967 reserves all orbiting objects and the universe beyond the earth's atmosphere exclusively for peaceful

purposes [29 p. 85]. The Nuclear Test Ban Treaty of 1963, the Nuclear Non-Proliferation Treaty of 1970, the Latin America Nuclear Free Zone established in 1967 [59 p. 594] and the Treaty banning Weapons of Mass Destruction from the Deep Ocean Floor of 1970 are other steps in this same direction.

None of these treaties invalidate the right or necessity of a nation maintaining an armed force. Actually, a majority of national governments operate on the conviction that: "Military security is the most dominating and pervasive factor influencing nations' attitudes to management of the oceans" [42 p. 22]. If this is the case, the issue of peaceful use and national security of the oceans will prove to be the major issue for the Law of the Sea. What is involved is finding acceptable laws that diminish the likelihood of disputes or conflict and that are credible through the potentiality of their effective enforcement by various means, including military force. Peace and security have never proven to be incompatible with the existence of military forces but, perhaps, quite the contrary.

The United Nations Charter sets some definite rules governing the lawful use of military force. While Article 2 enjoins states to "... refrain from the ... use of force," it makes a distinction between unlawful territorial intervention and lawful enforcement. Chapter VII of the Charter stipulates circumstances governing the legitimate use of force. Article 42 gives the Security Council the authority

to take such action by air, sea or land forces as may be necessary for the maintenance or restoration of international peace and security. Article 43 envisions member nations making available certain of their armed forces to the Security Council pursuant to special agreements. Article 51 maintains the right of self defense of individual nations or groups of nations. Chapter VIII makes legitimate any regional collective defense arrangements among nations.

From the UN Charter and other treaties, "peaceful" has the connotation of non-aggressive [18 p. 85]. The Charter, specifically, makes the basic distinction between "... impermissible coercion ('aggression', 'threats to the peace', 'intervention') and permissible coercion ('self defense', 'police action', 'reprisals', 'sanction')" [52 p. 340]. Since the difference is subjectively determined by member states in the UN Security Council or General Assembly or asserted unilaterally or collectively when resisting an armed attack, it has been suggested that the terminology "... peaceful versus aggressive ..." be discarded in favor of "... permissible versus prohibited activities" [2 p. 99]. Logically, then, "peaceful" equates to "permissible" and "aggressive" equates to "prohibited" activities, which is common place in metropolitan law. By these criteria international law would attempt to see through subjective adjectives and apply itself objectively to activities. Such criteria reach beyond any narrow concept of "security" and apply to all seven major issues being discussed in this

paper. Broadly, the issue of peaceful uses and national security of the ocean is one of balancing the needs of nations in order that they may protect themselves politically, economically and militarily, while the world oceans are preserved as a "peaceful" domain and common heritage of mankind.

2. The Territorial Sea ✓

The territorial sea is defined by the 1958 Convention on the Territorial Sea as an extension of a nation's sovereignty "... to a belt of sea adjacent to its coast ... to the air space over the territorial sea as well as to its bed and subsoil" [20 p. 49, 13 pp. 343 to 344). The issue of territorial seas, however, might best be restated as the delimitation between national and international jurisdiction over ocean space.

This leads to the discussion of the high seas. The 1958 Convention on the High Seas defines the high seas as "... all parts of the sea that are not included in the territorial seas" [13 p. 57]. The treaty further states that the high seas are "... open to all nations ..." and cannot be subjected to the sovereignty of any nation [20 p. 50]. The freedom of the high seas concedes to subjects of international law rights respecting overflight, fishing, laying of cables and pipelines and other rights recognized under established principles of international law [4 p. 13]. Many new deepsea activities are not explicitly included in the treaty. The Convention recognized the equal right of all

nations to use the high seas and to jurisdiction over their own ships, but requires that no state interfere with the lawful use of the high seas by another nation [31 p. 27]. Conflicting uses of the high seas are to some degree governed by regulations such as the International Rules of the Road. The 1958 Convention on the Continental Shelf requires that installations on the shelf not cause "... unjustifiable interference with navigation, fishing or conservation". Nevertheless, permanent installations and uses generally have precedent over transitory installations and uses [15 p. 43]. The use of the high seas thus becomes one of "... reciprocal restraints ..." [31 p. 27] between all nations and marine users.

The territorial sea, then, is already well defined by international law except for a precise and universally accepted breadth. Increased and diversified uses of the ocean are straining the traditional freedom of the sea and stimulating expansionist claims on behalf of the territorial sea. One of the most significant freedoms to the U.S. Navy is that of innocent passage. Section III of the Territorial Sea Convention allows the navigation of any nation's ships in the territorial sea of another as long as that passage is "... not prejudicial to the peace, good order or security of the coastal state" [13 p. 347]. Submarines are required to remain on the surface and display their national ensign. But the right of innocent passage does not extend to flying aircraft [59 p. 306]. Although Section III does not

specifically mention the applicability of innocent passage to warships, the general rule does not deny such right [29 p. 76]. Many coastal states, however, have put several burdens on naval mobility by requiring advance notice of the passage of naval vessels through their territorial sea or denying passage altogether.

The solution of this issue is of high consequence to all states, but those with coasts and/or ships have special interests. Coastal states are concerned with the exploitation of natural resources off their coasts and the degree of security afforded by the territorial sea. Shipping nations seek assured passage for their ships in peace or war on, over or in the maximum expanse of ocean space. The U.S. Navy, in particular, wants such freedom of movement for any American or allied warship or related craft, including those that are nuclear powered and/or nuclear armed. And, by this achievement, the allies would automatically provide this freedom to non-allied nations. Obviously, coastal states that are also naval and/or maritime powers, such as the U.S., find themselves with a conflict of interests.

3. International Straits

International straits through waters either presently or potentially declared as territorial are defined by the 1958 Convention on the Territorial Sea in Article XVI [59]. They are: "... straits which are used for international navigation between one part of the high seas and another part of the high seas or the territorial sea of a foreign

State" [13 p. 348]. At least 116 of these internationally used choke points have been identified on the oceans main shipping lanes (Figure 2) [72 Table III], with about 16 considered as major straits.[44 p. 772]. Man made canals and acknowledged internal waters constitute additional problems which are dealt with in other specific international agreements.

All of Articles XIV through XVI of the Territorial Sea Convention are applicable to passage through international straits. A critical principle applicable to the international strait is that "... there shall be no suspension of innocent passage" [44 p. 770]. The International Court of Justice in the Corfu Channel case of 1949 ruled that in time of peace a warship can transit an international strait as long as its transit is innocent [44 p. 769].

Most international straits are so narrow that any international agreement to extend the territorial sea to a maximum breadth of twelve miles would place at least all of the 116 straits mentioned above in territorial waters [2 p. 26]. By a subjective interpretation of the innocence of passage, one or more states bordering a strategic strait could attempt to arbitrarily deny passage to the vessel of another nation. The failure to provide for an unfettered right of passage through straits would, therefore, be a potential source of conflict and threaten international trade and security. A new concept, that of free transit is being advanced as a preferable alternative to innocent



Figure 2. World Straits Affected by a 12 Mile Territorial Sea
[Office of Geographer, Department of State]

passage through international straits [2 p. 26]. Free transit would treat international straits as if, for purposes of navigation, they were high seas but reserve to the adjacent coastal states their territorial rights with regard to pollution, resources, etc.

Until the present, straits were termed international more as a result of historical usage than of any established criterion. On November 16, 1971, Indonesia and Malaysia declared the Straits of Malacca between them no longer an international strait [4 p. 18]. International law does not support such contention, but it may now be necessary to designate by treaty all presently used international straits and provide a means of establishing in the future additional straits as international when such were warranted by changes in world commerce routes or territorial sea breadth.

4. Marine Scientific Research

This deceptively singular issue has great significance when seen as the pace setter and catalyst for developments concerning all other issues and particularly the next two issues: resources and pollution. Marine research covers any investigation of the naturally occurring phenomena in the marine environment. At the present stage of technology investigators utilize a variety of platforms (ships, submarines, aircraft, buoys, satellites, underwater installation, etc.) and a variety of techniques (visual, in situ measurement, dredging, coring, seismic, electronic, photographic, chemical, acoustical, laser, computer, etc.). The

issue here is to what extent can the traditional freedom of marine research be preserved and make use of platforms, techniques, data and geographical areas. In the coastal zone, where the most promising research beckons, the scientist is finding increasing difficulty working because of ever more extensive claims for national jurisdiction over the shelf and sea above. The 1958 Convention on the Continental Shelf at Article 5 makes clear that the coastal state or other users of coastal waters shall not interfere with "... fundamental oceanographic ..." or "... purely scientific research into the physical or biological characteristics of the continental shelf" [29 p. 8]. Even though the consent of the coastal state is to be obtained for research, this consent "... shall not normally ..." be withheld [29 p. 8]. No mention is made of a coastal state being justified in withholding this consent for political, economic, pollution or defense reasons.

In order to maintain a strong and competitive sea force, the U.S. Navy needs continued access to study the ocean environment, especially the shallow or near shore areas where economic, political and tactical activities are concentrated. Several dilemmas appear. Where does scientific research stop and intelligence begin? How can it be determined if scientific data, harmless in the past, could be used against a state in the future? Where does national scientific research stop and international scientific research begin? What kinds of marine platforms constitute legitimate research platforms?

The U.S. Navy can use any information about the marine environment to add to its capabilities to operate in the environment. "There is nothing in the science and technology of oceanography which does not effect the Navy in some way" [32 p. 24]. To speak of scientific research of the ocean as solely altruistic is clearly an exaggeration. The international community must accept the fact that all marine equipment, resources, data and expertise have a potential dual role. That is, they can be used to serve general humanitarian or particular group interests or as force against any nation. The research issue then is not what scientific research will be allowed or by whom, but where marine investigation may take place and under whose authority.

5. Marine Resources

In the past, human demands on marine resources were selective and localized. Man concentrated on a few specific species of marine life and a few minerals which they extracted relatively near the shore. As population and technology has spread and grown about the world, demand has increased and the consumption of resources accelerated. Unfortunately international law, national policies and academic discussion respecting marine resources define them very narrowly. The scope of present and future marine uses widens considerably when one adds tourism, aquaculture, trace mineral mining, pharmaceuticals, nodule precipitation, energy extraction, etc. These uses in turn widen considerably the number of naturally occurring resources in the oceans

that can be utilized by man. Wave action, heat capacity, density layers and deuterium of the ocean's water, for example, may someday be worth a great deal in terms of marine transport and energy source. Thus, marine resources ought to be defined as embracing all living, non-living, renewable and non-renewable resources extractable from the seas, either now or in the future. A meaningful discussion of the marine resources issue requires that all foreseeable uses and quantities of value in the ocean be considered with the clear recognition that on our finite planet all resources are limited.

For the remainder of this century, at least, the greater part of marine resources will be extracted from the continental shelves (Figure 3). The 1958 Convention on the Continental Shelf has given coastal states exclusive jurisdiction over the adjacent seabed and attached living and non-living resources to a depth of 200 meters or greater, where exploitable. It does not include the water or air column above the seabed [13 p. 375]. This rather short treaty has divided a fantastic amount of the ocean's total resources. Ninety-six states out of 151 (as of February, 1974) total are coastal nations with an extensive area of adjacent shelf while only 31 countries are landlocked (the other 24 states are shelf locked, that is their shelf is limited by the shelf claim of another state) [2 p. 15]. These continental shelves to a depth of 200 meters constitute 7.6% of the world's total seabed (Figures 4 and 6) [1 p. 3]. The

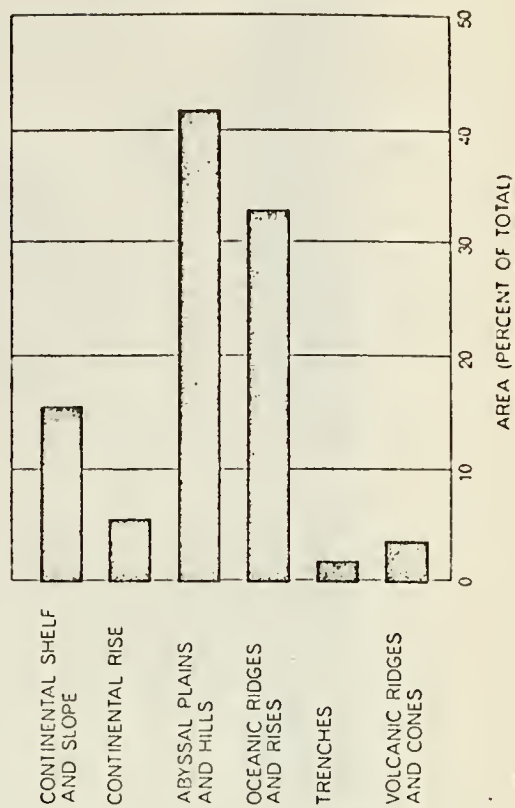
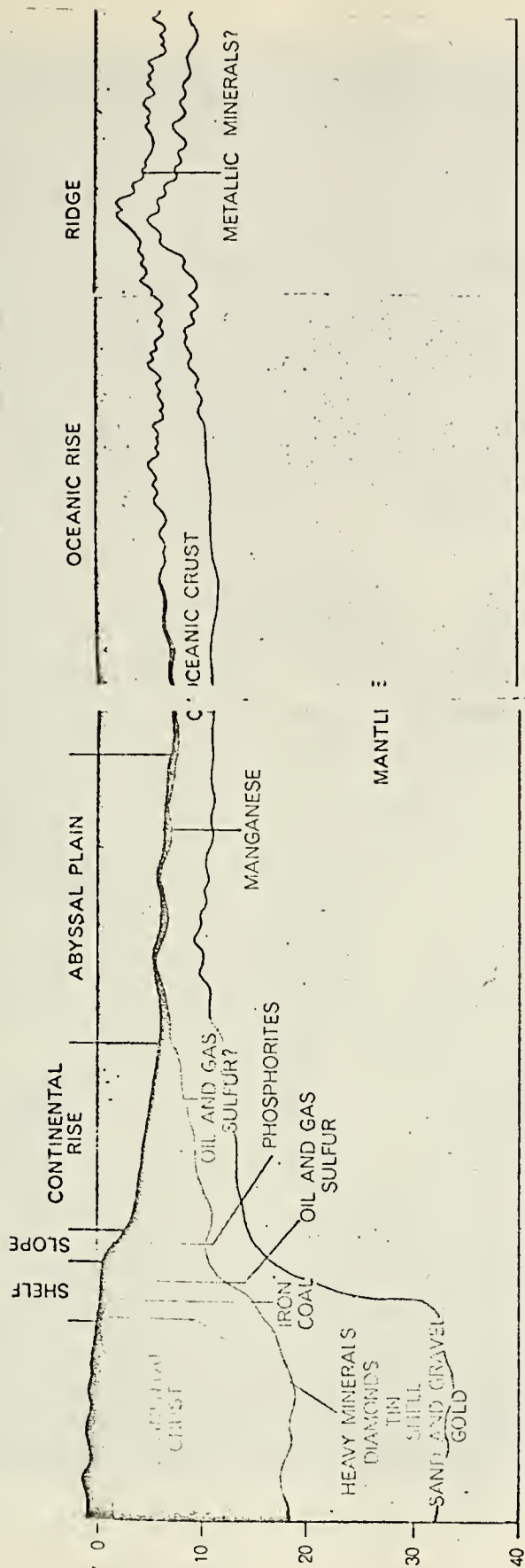


Figure 3. Ocean Floor Resources and per cent of World Total Seabed in Each Region.



Figure 4. Major Topographic Divisions of the Continental Margins; Shelf, Slope and Rise
[Office of Geographer, Department of State]

entire shelf regions, including the continental slope, amount to 15% of the 140 million square miles of seabed [25 p. 11]. Aside from fishing, the most immediate utilization of the continental shelf will be for oil and gas extraction [56 p. 74, 84]. Secondly, it will continue to be a source of sand, gravel and shells as well as a dumping ground [1 p. 4]. In the future, this shallow seabed will be used to a much greater extent for transportation, navigational aids, power plants and living installations.

Much of the controversy over the extent of national jurisdiction over the shelf's resources arises from the distinction between the legal and physical definitions of the shelf [1 p. 2]. This is one example of the problems encountered when the marine scientists' view of the Law of the Sea and that of the international lawyers' are not the same [32 p. 26]. International debate is now centering on the establishment of a marginal ocean zone extending beyond the territorial sea to give the coastal state some degree of control over the water column beyond its sovereign domain. This zone has been named and interpreted in a variety of ways including: the contiguous zone, the patrimonial sea, trusteeship zone, fishing zone, and, most recently, exclusive economic zone [48].

In addition, many technologically advanced nations are endeavoring to exploit the resources of the high seas and deep ocean seabeds. Traditionally, the Law of the Sea has conceded to any nation the right to exploit whatever



resources it finds in the high seas or deep ocean seabed and to control such activities under its flag. One historic precedent for this principle may be found in the United States statutes, The Guano Islands Act of 1856 which states:

Whenever any citizen of the United States discovers a deposit of guano on any island, rock, or key, not within the lawful jurisdiction of any other government, and takes peaceful possession thereof, and occupies the same, such island, rock, or key may, at the discretion of the President, be considered as appertaining to the United States [15 p. 42]

For the United States Navy, the marine resources issue presents various concerns. A far ranging and technologically advanced naval force needs raw materials. Of the 72 natural resources the United States government has identified as strategic, only 12 are found within the nation's boundaries [32 p. 25]. A fossil fuel powered Navy or even a nuclear powered one must still compete, through the government, for marine resources in both the national and international markets. In addition, the expansionist claims of coastal states for wider jurisdiction over marine resources and the erection of installations for their exploitation may hinder or exclude naval operations. Not least, the greater activity and investment of the United States and its nationals in marine resource exploration and exploitation will necessarily involve the Navy in providing increased protection and related capabilities.

The marine resource issue of who gets what, when and how will become aggravated as the "revolution of rising expectations" within each nation increases both real and

perceived demands. The great hope that the oceans will, somehow, provide for terrestrial shortages has only made the equitable and long term distribution of ocean resources more difficult.

6. Marine Pollution

Pollution is a highly emotional issue. One result is national regulations being hastily adopted which, in fact, have proved ecologically detrimental or impossible to enforce. Such experience may be profitably noted and utilized at the international level. The pollution issue is certainly one where scientific research and advice is absolutely mandatory if society is to conserve its environment and, also, avoid the passage of useless or harmful laws.

According to the Intergovernmental Oceanographic Commission of UNESCO, marine pollution is:

The introduction by man, directly or indirectly, of substances into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities (including fishing), impairing the quality for use of seawater and reduction of amenities [43 p. 146]

These substances appear in a variety of forms: chemicals, solid wastes, petroleum, dredging and fill material, microorganisms, radioactive matter, heat discharge and atmospheric fallout. Marine pollution, therefore, originates from a variety of sources and is present at a variety of levels. It is certain, however, that the great bulk of this pollution is a result of the activities of the few



industrialized states and enters the oceans along these states' coastal zones [77]. It is estimated that 90% of the oceans' total pollution got there via river runoff and atmospheric fallout [54 p. 1], with most of the remaining 10% attributable to oil. Since 60% of the annual world's oil production is transported by sea, a sizable quantity, over 1000 million metric tons of which is annually lost directly into the sea [56 p. 21]. Most of this oil comes from the washing of storage tanks of ships in port [54 p. 4].

Virtually all marine pollution originates from territory, including coastal waters, traditionally beyond the jurisdiction of international law. Yet, most international attempts at controlling marine pollution have been directed at the dumping of pollutants, especially oil, by ships on the high seas. The Convention on the Pollution of the Seas by Oil of 1954 was one of the earliest. The 1958 Convention on the High Seas requires every signatory state to establish regulations to prevent pollution by oil discharge from ships and pipelines, pollution resulting from seabed resource exploitation and pollution of the seas or airspace above from the dumping of radioactive waste [13 p. 364]. The 1958 Convention on the Territorial Sea only recognizes the authority of the coastal state out to the end of a twelve mile contiguous zone to "...prevent infringement of its ... sanitary regulations within its...territorial sea." [13 p. 350] The International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution

Casualties of 1970 does not apply to warships. More recently the United States enacted the Marine Protection, Research, and Sanctuaries Act of 1972 that prohibits the dumping of any substance into the nation's territorial sea or contiguous zone without a permit [54 p. 27]. The Act prohibits dumping of high level radioactive wastes and applies to all vessels, including those of the Navy and government. The Coast Guard is given the responsibility for the surveillance of marine dumping activities [54 p. 28]. In the same year most of the world's large industrial and maritime states signed the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. This treaty does not apply to vessels and aircraft entitled to sovereign immunity and, thus, all navies are exempt from its provisions. Neither does it affect scientific or military installations or devices in the water or seabed [54 p. 31].

Even though the United States is a party to all the international conventions mentioned above, the U.S. Navy is apparently unhindered by them, since the past trend of international law has been to exclude warships from such pollution regulations. In actuality, naval vessels do contribute only a small amount to the world's ocean pollution [54 p. 31]. Still, the U.S. Navy is a victim of marine pollution as are all ocean users. Ships, aircraft, equipment and men can all be degraded in performance by harmful substances in the marine environment. As pollution

regulations become more numerous and extensive, the Navy will no doubt be called upon to enforce them where other guardians cannot. It will be hard to justify stringent regulation when the government's marine activities and vessels do not comply as well. Most naval bases have undertaken, with local communities, to clean up their shared estuaries and shorelines in the last few years. Most notable is the project at Pearl Harbor. The problem of accurate pollution measurement is most difficult and, to the present, has been almost totally ignored. Naval research facilities are aiding in the development of proper equipment to overcome this problem while naval platforms can expect to be used in the actual monitoring.

7. The International Ocean Regime

Beyond the territorial seas, contiguous zones, continental shelves and economic zones lies a vast ocean space not under national jurisdiction. This ocean space has historically been subject to little law or regulation. Individual states sometimes enforced through their courts the international rules of the road and settled admiralty disputes. International agencies more recently began to prescribe new standards of safety, navigation, resource extraction and conservation. But on the whole, the unwritten laws among seafarers made the seas a model of common usage and non-proprietaryship. Now this loose order for the ocean is proving inadequate in the face of new and increased marine activities. Therefore, in order to avoid chaos the

high seas are destined either to be managed by the international community or divided among the coastal states.

Even though the exact bounds of the high seas are still to be determined, its traditionally laissez-faire legal environment will have to become more structured as competing and conflicting demands are put upon it. The United Nations, in General Assembly Resolution 2749(XXV) of 1970 [13 p. 506], has recognized that an encompassing regime to govern this international property is necessary. This regime should be considered to include all the treaties, organizations, representations, procedures and regulations necessary to the governance of ocean space.

The issue of an international regime involves the determination of the power that the regime will need and exercise on behalf of the world community versus the power that the coastal states will claim and reserve for their partial or exclusive jurisdiction. The international community has, to some extent, already polarized on the issue. About twenty of the less developed states on the United Nations Seabed Committee want a marine regime with extensive authority, including the power itself to engage in resource exploitation and to police, inspect and license the marine activities of commercial companies and national states. For the most part, they are opposed by the more developed states, especially those with advanced maritime capabilities [42 p. 28]. The United States, as one of those advanced maritime states, has "...suggested that the

international agency limit itself to licensing states or enterprises sponsored by states, inspecting and regulating their activities and collecting revenues for the international community." [66 p. 475] In addition, the U.S. indicates that "...the more industrially developed states, whose activities will be most affected, will require a voting structure that protects their interests." [66 p. 476]

To effect a compromise between these two views an effective regime must evolve a new form of international organization based not only on the one nation-one vote principle, but also on the representation of commercial and scientific interests as well. A comprehensive proposal for a new type of organization is found in Elizabeth Mann Borgese's Ocean Regime; it would put national representatives, marine producers, marine consumers and scientists in four councils constituting the legislature.[9]. In its character, the international regime might become part government, part business, part tribunal and a new international philosophy. Such a working regime has the possibility of so linking major ocean issues together that the member governments could make the optimal trade-offs among their conflicting solutions.

Under the present legal regime of the ocean, the U.S. Navy enjoys a maximum of freedom. Any new order that were more structured would seem only to curtail this freedom. Such curtailment might threaten naval mobility and activities. A new regime might require and enforce pollution, safety or navigation standards noxious to the Navy and unacceptable to

the U.S. But the curtailment of more freedoms appear inevitable unless an effective international regime precludes excessive national encroachment upon the remaining open space, especially as economic competition becomes more intense. A consistent and objective international regime stands to provide the Navy with a better guarantee of freedom for naval operations within the bounds of established international law than a free and open system subject to the whims and assertions of individual coastal states. Responsible maritime users should find it more satisfactory to operate under a single authority than the myriad of conflicting national and regional regimes now emerging to fill the jurisdictional vacuum on the high seas. The concern of the U.S. Navy is to determine which international arrangements would provide the best accomodation for the needs of America's world-wide maritime power and the sea force which supports it.

C. THE INTERACTIONS OF THE ISSUES

It was stated earlier that the division of the Law of the Sea problem into seven major issues is for analytical convenience only. The preceding introduction of each of the issues illustrates how involved each is with the others. The maritime states are not only concerned with how extensive their territorial sea might become, but also how the territorial sea of others might affect their own transit through straits. Coastal states are concerned with the pollution affects from large scale resource extraction, while less developed countries feel that a weak international regime

would concede to the developed countries unchallenged access to the ocean's resources. The naval powers are concerned that any further limitation of marine research would be detrimental to the maintenance of national security, while some less powerful coastal states are apprehensive about others exploring off their coasts.

It would require a complex matrix just to depict the interrelationships among the seven major issues which are of greatest relevance to the U.S. Navy. Nevertheless, for an analytical examination, each issue must first be weighed separately with scientific and societal gauges. Afterwards, the interdisciplinary synthesis should take into account all ocean users. Both the analysis and synthesis are work for lawyers, politicians, marine scientists, marine industrialists and naval strategists.

Several interactions can be identified as possibly providing keys to turn and resolve a number of issues. In fact, some interactions may prove more important than the constituent basic issues. Most notable among these is the effect of extending the territorial sea to twelve nautical miles or more upon other issues. The 116 identified international straits come first to mind, but scientific research could be limited by an extensive territorial sea or itself help confine the pressures for massive extensions by accurately delimiting the areas of greatest economic potential. Additionally, universal and enforced pollution regulations might help induce states bordering international straits to concede

the right of unimpeded transit. For all these reasons, it would appear that the character of the international regime cannot be determined until the precise limits of national jurisdiction are established.

IV. THE SPECTRA OF PROBABLE SOLUTIONS TO THE ISSUES

A. CONSTRUCTION OF THE SPECTRA

For each of the seven major issues there is a wide range of possible solutions. This author has limited each range or spectrum so that, in his opinion, they contain at least the solutions which may be discussed by the international community within the foreseeable future. Examination of each spectrum will seek to identify: (1) the present situation regarding each issue, (2) the most likely solution in view of the present international climate, and, in the writer's opinion, (3) the best solution for the U.S. Navy, and (4) the optimal solution for the United States. It is noteworthy that the last two solutions may not always be coincident and axiomatic that the latter solution ought ultimately to be given precedence over the former. Discussion of other solutions within each spectrum whenever they particularly effect the U.S. Navy may also be included.

Some of the spectra are continuous, for example, the territorial sea where an infinite number of solutions is possible. Others are by their nature discrete, such as the international straits, the solutions to which take several distinct forms.

Each spectrum will be arranged on two scales. One scale will position the solutions such that the most laissez-faire is on the left and the most structured or publicly regulated is on the right. This analysis of unstructured to structured

solution might be the most restrictive to naval operations in some cases, it is by no means always so. The second scale will position the solutions such that the one of most extensive national jurisdiction is on the left and the one of most extensive international jurisdiction is on the right. These scales are only qualitative and certainly not all inclusive. Neither the solutions or their discussion are meant to be exhaustive but are meant to bring out the most important aspects of the Law of the Sea to the U.S. Navy.

B. SPECTRUM 1: NATIONAL SECURITY AND PEACEFUL USE OF THE OCEANS

The emerging Law of the Sea has been viewed by some as a vehicle for the partial or complete demilitarization of the ocean, with the hope that this would lead to the "complete and general disarmament" of the world. This goal is one of the "Basic Principles of Relations between the USA and USSR," signed by President Nixon and General Secretary Brezhnev, May 29, 1972, and repeatedly promulgated by the UN General Assembly. The demilitarization of 71% of the earth may sound fantastic, but it might well contribute to insecurity and aggression where before available sea forces were a deterrent. The demilitarization of the ocean is not likely as long as militarization on the land gives people reason to fear and seek counter balancing means of deterrence and defense. It may be argued that the demilitarization of outer space and Antarctica and the denuclearization of the seabed are analogs for the demilitarization of the oceans

as a whole. The critical difference is that the oceans have a history of military use, whereas the others have not, and the ocean is now being utilized militarily unlike the other environments [25 p. 58].

Janes's Fighting Ships indicates that 107 states possess national navies, although only some twenty have significant ones of more than coastal capability. Thus, many members of the international community might believe it advantageous to declare the immediate demilitarization of the seas [2 p. 85]. However, the larger number will not wish to forego the option of receiving military assistance from others in a moment of trial. It is reasonable to conclude that for a majority of states military considerations "...will far outweigh any consideration of economic development." [9 p. 26] Certainly, coastal states will be prodded by their own navies to insist upon provisions to accommodate defense interests in any international framework [1 p. 14].

The arguments over demilitarization must not be allowed to stifle all progress in a new ocean order. Doctrinal or emotional preoccupation with the presently unattainable goal of complete prohibition of military use of the ocean would only delay dealing with more immediate obstacles such as differences over an international regulatory system for commercial development [18 p. 113]. Hopefully, some compromise may be found which would acknowledge, pursuant to international law, an inherent right of every state to make "peaceful use" of the ocean, including lawful use of national

military forces in the high seas [9 p. 11]. To be realistic "peaceful uses" must not exclude the military from activities such as scientific research, the temporarily exclusive use of prescribed parts of the ocean by the military and the placement of military tracking and detection equipment on the seabed [9 p. 20]. No restrictions would prevail, of course, whenever, a state exercised its inherent right of self defense or collective defense against an armed attack, as set forth in Article 51 of the UN Charter. Nor would enforcement measures pursuant to decisions of the UN Security Council or General Assembly be contrary to the exclusive use of the ocean for peaceful purposes.

Were future international law to prescribe the peaceful uses of the oceans that were authorized national military forces, there would be little scope for new technology and change. Rather, new law should only define what is considered not peaceful. Even so, thoughtful consideration should be given to possible scientific and technological achievements which may change present intentions as to the law. For example, the submarine, under the current law of "innocent passage" must surface when transiting, but present and anticipated technology makes this requirement a danger to the sea-based deterrent of the nuclear powers. The nuclear powered, long range ballistic missile submarine presently capable of speeds approximating 40 knots and operational depths of more than 1000 feet [6 p. 24] is able to utilize

the marine environment continuously for concealment and to retaliate with assured destruction against all points on the land mass [21 p. 33]. Under development by the United States today is ULMS, an Underwater Launching Missile System extending the Poseidon missile's range to at least 6000 miles [2 p. 78]. The maximum value of the military submarine is attained only when it is allowed both to remain submerged and maintain wide freedom of movement [2 p. 80]. As anti-submarine warfare techniques improve, submarines must devote more emphasis to concealment and mobility in order to maintain their viability and deterrent role [29 p. 184].

The United States and the Soviet Union operate the overwhelming majority of strategic missile firing submarines. So far, neither has proposed any limitation on their operations [25 p. 52], but only on their respective number. Many other nations have submarines, both military and research types, and several have or are building strategic missile firing submarines, i.e., Great Britain, France, and The People's Republic of China. "If there is a validity in the widespread belief that the existing deterrent system works to reduce the likelihood of a major nuclear war, then it is extremely ill-advised to take actions which could lessen the effectiveness of that system." [18 p. 94] Because of their invulnerability, the "...missile launching nuclear submarine represent the least unstable form of the arms race and we are probably going to keep them...in the deep oceans." [39 p. 171].

To date, there is no great threat, military or legal, to the nuclear submarine in deep water [21 p. 33]. The Seabed Disarmament Treaty leaves an enormous water volume in which navies may operate, a volume that could only be further limited legally in progressive increments upwards from the seabed to the maximum crush depth of military submarines [75 p. 418]. In the author's opinion, present international law, with the exception of needed unhampered transit right through international straits, is functioning adequately for the use of military strategic submarines. What will tomorrow bring? Dr. John P. Craven observes that the sea's surface has always imposed restrictions upon its use. He mentions:

- (1) the perils posed by the changing conditions of the wind and the sea;
- (2) the impossibility 'to make landfall at an arbitrary portion of the coast for transfer of personnel or cargo' under moderate or modest sea conditions;
- (3) the limitations of speed on the seas;
- (4) the exposure to optical and electromagnetic spectra;
- (5) accommodation of large volumes and tonnages, limited by draft and harbor conditions;
- (6) accessibility of seaborne vessels and installations to aircraft or airborne vehicles [25 p. 54].

This list suggests that more and more marine activities in the future will be conducted submerged.

Past legal solutions to ocean use problems have tried to keep surface and submerged activities differentiated, e.g., the 1958 Conventions. Future proposals for the Law of the Sea, though, must consider a technology that is invalidating

this dichotomy and sure to "...add complications not now evident." [21 p. 33]. Submersibles may be developed that are:

- (1) nonmilitary
- (2) unable to operate on the free surface
- (3) designed to operate principally at very deep depths
- (4) able to operate primarily at or on the bottom
- (5) unpowered and serve as underwater barges or semimobile stations
- (6) low-cost and thus available to a rapidly expanding number of users. [21 p. 33]

The Grumman Corporation has successfully submerged the Ben Franklin in the Gulf Stream to drift for an extended time and distance, illustrating at least (1), (5) and (6) of the above [56 p. 119]. A need can be seen for regulating traffic for submersibles, including military ones as they increase in number and mobility [29 p. 84]. It may even become necessary to identify all submerged, man-made objects, since a form of anonymous warfare is otherwise made possible. One observer has speculated that certain military forces be assigned "...an especially protected position." [18 p. 90]. But electronic means of identification appear more promising as a future solution.

If Mahan's axiom that technology changes tactics, but not strategy, is true [19 p. 139], then the present ocean strategy and accompanying law should prove valid as long as the missile armed submarine is effective as a deterrent or destroyer. The submersible appears to possess now and in the foreseeable future advantages over any anti-submarine forces. The great emphasis of anti-submarine technology has recently

been in acoustical detection, so this threat is presently the most likely danger.

Acoustical systems are operational on the seabed, in the water column, aboard aircraft, from submarines and upon surface ships. Hydrophones can be placed on the seabed or slightly above it in order to maintain a continuous watch on the sound channel at ranges extending across ocean basins. The axis of the sound channel varies in depth from the surface to 2000 meters in the world's oceans. A passive listening system is most effective when implanted in this channel, because sound is therein focused and transmitted great distances. Present military submarines have maximum operating depths far less than 2000 meters, while the seabed of the continental shelf or slope is generally of a depth within the sound channel [2 p. 79]. For ocean basins the topography of which does not accommodate shelf mounted acoustical arrays, basic research is presently aimed at hydrophone systems capable of deep ocean surveillance. Deep ocean acoustical arrays must be located in strategic points in the water body to be effective. Since hydrophone performance is now nearly optimum, it is in the signal processing that the greatest advancements are yet to be made. These immobile arrays are limited by their hard line wire connections to shore based monitoring stations and the fact that high quality submarines can avoid transiting near the arrays or operate below the detection threshold of the passive system. However, acoustics are still the primary

tools of anti-submarine warfare (ASW). Submarines remain the best mobile acoustic platforms, while surface ships have the advantage of offering command and control in the ASW situation [12]. Near shore and shallow water areas pose other problems, such as high amounts of background noise generated biologically and by human activities [73 p. 161]. Present projects by the U.S. Office of Naval Research include: Suspended Array Subsystem (SASS), huge hydrophones held in the water column for detection in and below the duct; Towed Array Subsystem (TASS), small hydrophones for target localization by ships, submarines and helicopters; and Moored Surveillance System (MSS), air dropable semipermanent barrier hydrophones [6 pp. 25 to 27]. As a counter to extensive acoustical ASW efforts, military submarines have become ultra-quiet [19 p. 139].

Even with further improvements in acoustical systems, alternative means of detection must be available after any explosion in a hostile action saturates the water column with high energy, broad-band sound. Optical systems such as lasers are effective but only in the upper 100 meters or so of the water column. Satellite optical systems are often rendered ineffective by cloud cover. Magnetic Anomaly Detection (MAD) has many limitations. The detection of thermal scars, heat generated by a moving submarine appearing in a wake at the surface, is a new possibility as yet unevaluated [70]. The use of sufficient attack submarines as tails to shadow every deployed ballistic submarine is cost

prohibitive. Submarine hulls of small dimension made of titanium, fiberglass, plastic or stainless steel can possibly negate future gains which may be made in active sonar or magnetic detection systems [19 p. 140]. Such smaller, more versatile submarines could be powered with fuel cells making them cheaper, faster and more maneuverable over a short range than present nuclear powered submersibles [19 p. 139]. Consequently, in the foreseeable future, the submarine will certainly remain a formidable weapon in an opaque ocean. Any ocean policy and international law must reflect this fact.

Warships have traditionally been regarded as virtually sovereign and a part of a nation beyond its territorial bounds [13 p. 152]. However, military aircraft have never enjoyed this status. Aircraft may no longer constitute a viable strategic weapon system, but they still provide a significant contribution to sustained tactical and support operations [2 p. 81]. They can tip the balance in a limited conflict by permitting quick movement of ready forces or bringing devastating firepower against guerilla activity [29 p. 188]. Besides, aircraft are of growing importance in the international movement of passengers and cargo. Consequently, it is essential that overflight of international straits be treated just as movement over the high seas, unfettered and free.

Rules must certainly be developed against haphazard proliferation of underwater installations in the ocean.

Restraint and regulation must apply to military, commercial, navigational, scientific, communication and environmental monitoring devices, on and beneath the seabed [18 p. 95], whether afloat, in the water column or on the sea surface. It is impractical and perhaps threatening to attempt to outlaw those installations connected with anti-submarine warfare. Outright prohibition is neither a guarantee of peace nor a guarantee that the nuclear deterrent would be preserved [18 p. 89]. On the other hand, an all embracing international surveillance system to monitor ocean activity could be worthwhile for the control of civil transport, the monitoring of pollution and apprehension of law-breakers, but would have little military value [39 p. 169].

A map of merchant ship distribution (Figure 5) and of natural resources (Figures 9 through 12), indicates that sea control by a naval force requires dominance primarily of the shallower portions of the oceans [19 p. 142]. The continental margins, then, take on great importance for the major military powers [1 p. 5]. It is to be expected that any coastal state would normally perceive the presence of a surface or submerged naval force or device off its coast as a possible threat to its security [50 p. 8]. Although, no U.S. nuclear strategic submarine has ever threatened a coastal state just by transiting close to its shores [53]. Only the limited capability to detect and destroy the submarine or underwater installation has probably prevented many coastal states from banning these hidden military activities



DEPARTMENT OF TRANSPORTATION

Figure 5. Worldwide Merchant Ship Distribution in 1969

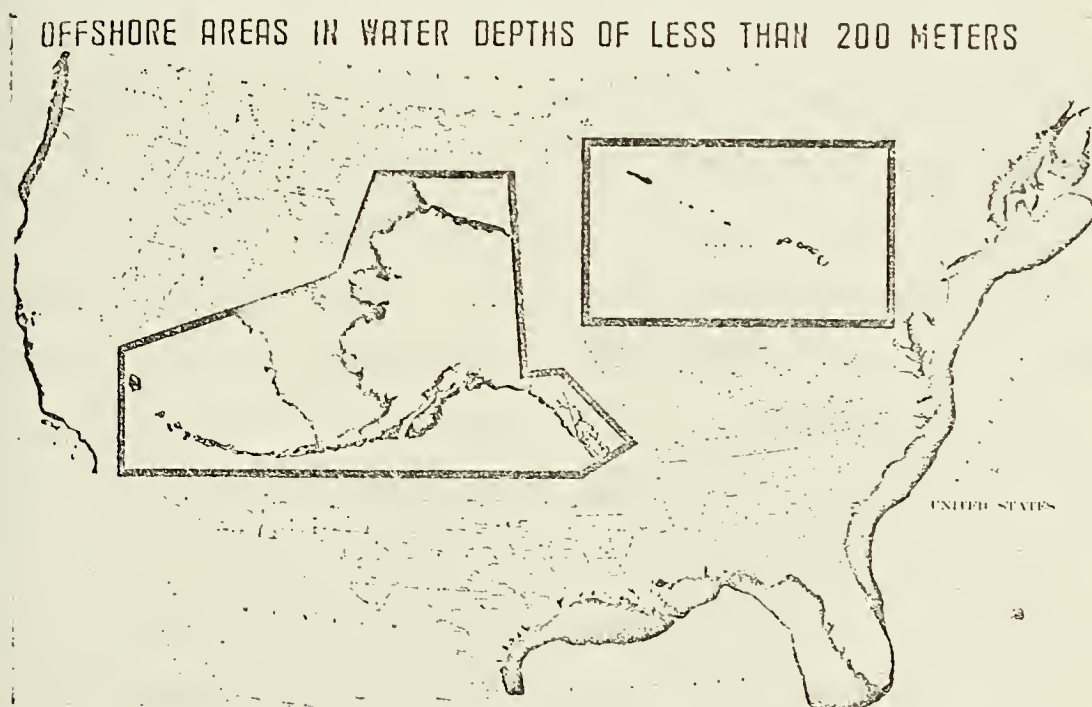


Figure 6. America's Continental Shelf
[United States Coast and Geodetic Survey]

from their continental shelves.[25 p. 56]. By the 1958 Continental Shelf Convention though, reasonable deductions as to the rights of military installations on the shelves can be made:

1. The setting up of military installations on the Continental Shelf should be placed under the control of the Coastal State, in the same way as the Continental Shelf is placed under its jurisdiction only for exploration purposes and the exploitation of its resources.
2. The setting up of such military installations must not interfere unreasonably with utilization of the Continental Shelf [18 p. 180].

This provision infers that the means must exist to police, prove infringement and punish any such rules established [18 p. 181]. Accepted international practice does not consider visual, electronic [50 p. 10], acoustic or seismic surveillance to be an infringement upon sovereignty. The scope of any new international laws concerning ocean military monitoring devices must be similarly restrained, so that they govern location and not the type of monitoring activities.

For world-ranging naval forces, the present situation is advantageous: full freedom of movement and activity while engaged in the peaceful use of the high seas and seabed beyond national jurisdiction. The critical problem is that coastal states are tending towards an expansion of their jurisdictions and reducing the area of the high seas. Therefore, more formal and structured internationalization of the high seas and deep ocean seabed affords a counterforce to national claims and unilateral extensions. The question, then, is how to establish a new international regime which

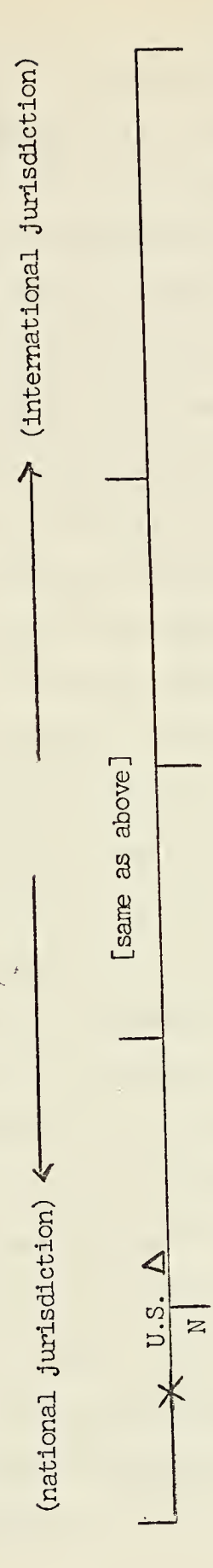
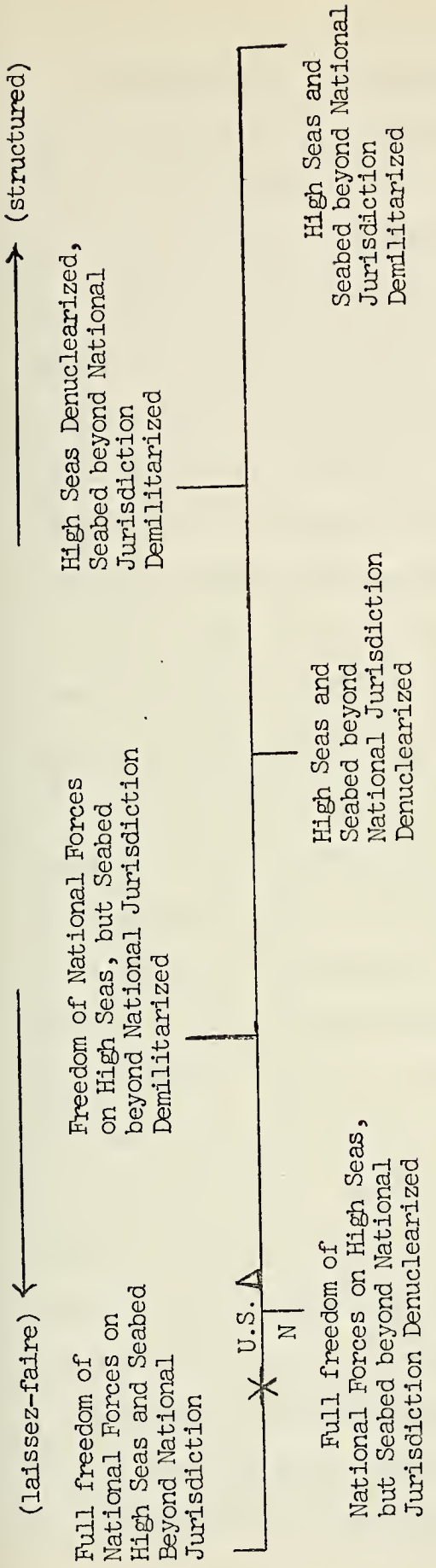
preserves essential uses to national military forces. The deep seabed should remain denuclearized, while the freedom continues to place military monitoring devices there.

Provision should be made for the safer movement of all ships, including submersibles, and nothing should abridge the right to deploy submarines with nuclear weapon systems in the oceans. This direction promises the best solution for the U.S. Navy and the United States as well.

Extensive restriction on naval uses of the high seas may well increase the probability of interstate conflicts at sea and, certainly, would add to tensions and uncertainties resulting from interrupted marine commerce and efforts to enforce allegations which would frequently lack credibility. In any period of tension or conflict, national navies would be required to react, perhaps thereby creating new breaches of international law due to unrealistic restrictions placed upon naval operations.

C. SPECTRUM 2: THE TERRITORIAL SEA

The foremost significance to the United States Navy of the territorial sea is how much of the world's ocean remains high seas. Freedom of movement on the high seas is most important to naval nuclear strategic forces. Freedom of transit through international straits and narrow seas and assurance of innocent passage through territorial seas are vital to conventional naval operations. Free transit through straits is critical to a quick initial response by naval forces [2 p. 82].



SPECTRUM 1:
National Security and Peaceful
Use of the Oceans

* legal status quo
 Δ most likely international solution
 U.S. best solution for United States
 N best solution for U.S. Navy

Proposals for the breadth of the territorial sea presently range from 3 nm to 200 nm [2 p. 14, 13 p. 351]. Great variations in motives produce this divergence and the many intermediary delimitations. Countries which insist upon a minimum territorial sea include those having large navies or merchant marines and far reaching, modern fishing fleets. Their economies are usually well developed and highly dependent on world trade. They include many states, but not all, that have a narrow continental shelf, few known off-shore natural resources or little threat from pollution by neighboring states. Those countries demanding an extensive breadth of territorial sea include coastal states with wide continental shelves and important coastal resources, plus others with economies already dependent on near shore ocean activities. Many developing states with substantial coastlines are supporting extensive territorial seas wishing to keep their diplomatic options open until their national interests in the oceans are better assessed [2 p. 15]. Some states have both near shore and far off-shore interests, and could support either a narrow or wide territorial sea. The United States and Russia are good examples. Thirty-one states are land-locked and normally share the interests of those favoring a narrow territorial sea and explicit limitations on the claims of coastal states. The land-locked are a significant and sometimes overlooked category of states that might provide a mediating and compromising force in the Law of the Sea negotiations.

The aspiration for a territorial sea of 12 nautical miles appears to have been given hope of eventual fulfillment internationally by the 1958 Convention of the Territorial Sea. Article XXIV [2] states that "... the contiguous zone may not extend beyond twelve miles from the baseline from which the breadth of the territorial sea is measured" [13 p. 350]. With the exception of most international straits, it ensures a near maximum of movement for shipping and navies, while giving the coastal states a significant amount of the continental shelves and water above. (Figures 4 and 6). A 12 nm territorial sea would include a great amount of the most exploitable living and non-living resources of the seas (Figures 9 through 12). It also provides an adequate defense zone against conventional warfare. However, navies and merchant marines of the world could effectively operate in an ocean where transit was guaranteed beyond a maximum of 12 nm.

The establishment worldwide of the twelve nautical mile territorial sea would have no important effect on present or foreseen operations of national seaforces, except those associated with the issue of the international straits. Aside from amphibious or support operations, the great bulk of peacetime U.S. Navy activities occur beyond twelve nautical miles. Strategic submarines need the maneuvering room and opaqueness of the open oceans, while surface ships obtain protection over the horizon and at greater distances from many shore-based radar, radio and visual detection systems.

A 12 nm standoff from a coast does, however, lessen such advantage a naval ship may provide when observable from shore, as for a show of force or the flag. Considering the ranges and navigation systems of modern ships, aircraft and missiles, a territorial sea of 12 nm would not appear to affect the nuclear stalemate in the oceans between the two super powers [2 p. 38]. Both the United States and Soviet Union support a 12 nm maximum limit conditioned on an international guarantee of free transit through and over straits used for international navigation [57 p. 826, 27 p. 4].

The 200 nm territorial sea represents the most extensive distance seriously pursued by any nation and its discussion is relevant to all claims much beyond 12 nm. Chile first advocated the 200 nautical mile distance in 1947 and today is joined by at least nine other Latin American countries. Extensive claims like these are not totally new. Spain and Portugal prevailed upon the Pope to divide the world's western ocean between them in 1493, while Russia, under the Czars, claimed almost half the Arctic Ocean as a closed sea. Recently, Canada unilaterally claimed exclusive control over the regulation of pollution in the Arctic zone from her shores to 100 nautical miles [46]. Iceland has made clear her objections to any other nationals fishing within 50 nm of her coast [31].

Most of the claims for a territorial sea wider than 12 nm are based, with few exceptions, on the desire to protect fishing areas upon which the economies of many of the claimants

have historically depended or which may be important in the future. They have apparently not been advanced primarily for jurisdiction over navigation or other rights associated with the territorial sea [44 p. 766]. Overfishing by local fishermen and the long ranging fleets of other nations has contributed to the decreasing annual catches in many areas since shortly after World War II [47, 35 pp. 539 to 546]. Since the contiguous zone of 12 nm and the continental shelf is already available to the coastal state by effect of the 1958 Continental Shelf Convention, a claim of a territorial sea of 200 nm does not offer much more than planktonic and nektonic living resources. The significant open ocean species of tuna, salmon and the like will have to be controlled by separate convention. The most biologically productive areas of the ocean (compare Figures 11 and 12 with Figure 7) and the anticipated mineral resources from the continental shelf (compare Figures 9 and 10 with Figure 7) do not conform to a two hundred mile line. At times such would even be inadequate but generally it is unnecessary. As a buffer against the most insidious and extensive forms of marine pollution, such as heavy metals, radioactivity, chemicals, micro-organisms and atmospheric fallout of vapors, a 200 nm territorial sea is ineffective.

The establishment of a territorial sea as wide as 200 nm would have grave consequences for every nation dependent on global transportation and trade. The United States, for example, moves 99% of its overseas trade by ship [31 p. 27].

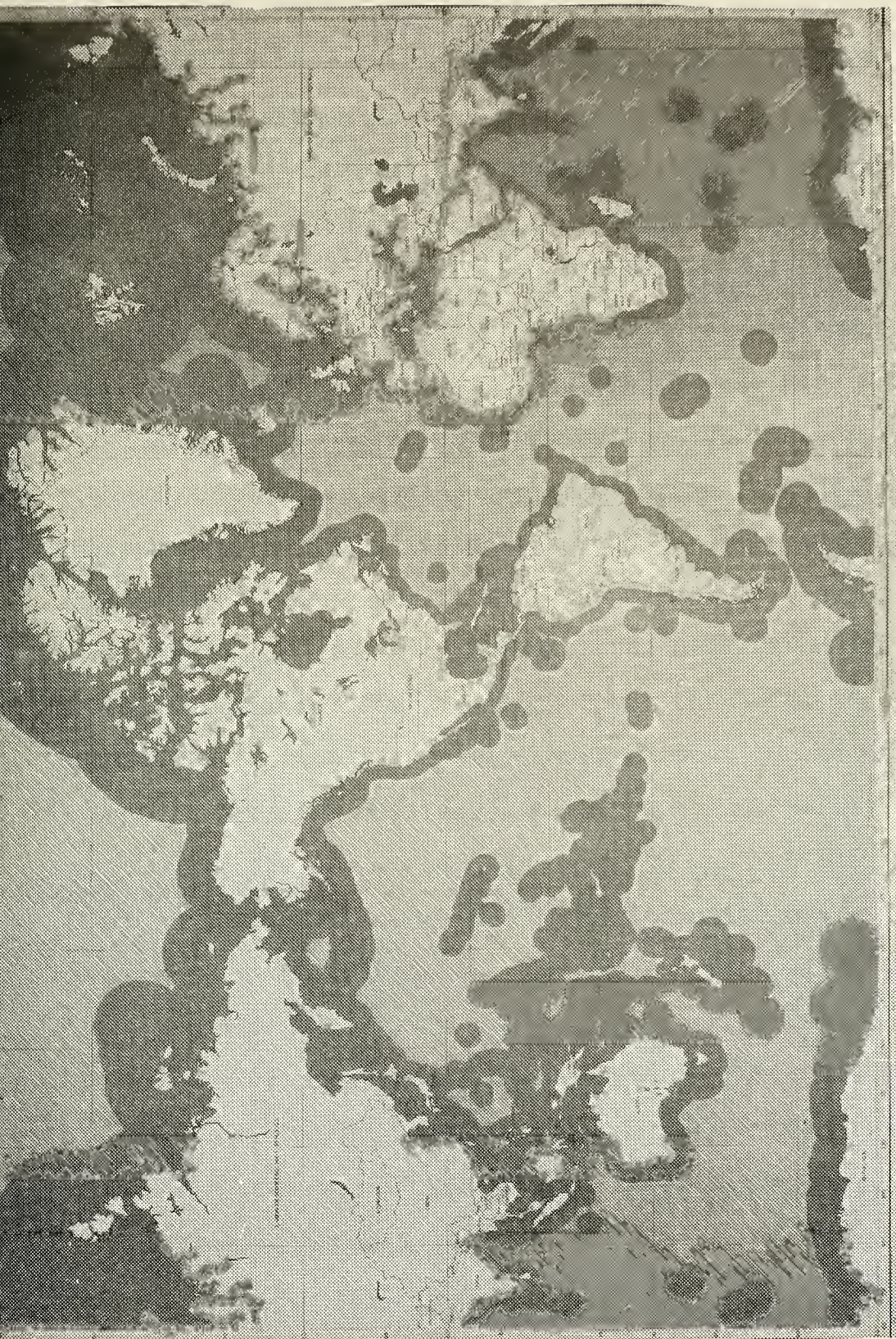


Figure 7. Global Effect of 200 Nautical Mile Territorial Sea Claims
[Office of the Geographer, Department of State]

Two hundred miles would also have serious repercussions for the strategic military balance among the great powers. This shift would affect every state, whether developed or developing. Figure 7 shows the extent of a possible world-wide 200 nm territorial sea. Essentially, the high seas would be limited to several large ponds in the Atlantic, Indian and Pacific Oceans. A warship could be legally trapped in one of these high seas if the claimed prerogatives of several coastal states to regulate passage were the rule. Naval strategy would be affected by the constrained limits to which fleets could maneuver or their weapons utilized. Twelve miles or 200 miles does not affect more than the accuracy of most medium to long range missiles, but the larger distance closes to unrestricted navigation the Mediterranean, Baltic, Sea of Japan, South China Sea, Caribbean and Gulf of Mexico [2 p. 80]. Such a great reduction in operating area for military submarines could greatly increase their vulnerability to ASW systems. In wartime the 200 nm limit would be even more intolerable to naval operations. Combatant states engaged in the survival of their country might unwillingly involve neutrals in their struggles.

Some states have added national security to their justifications for an extensive territorial sea. However, in view of present and predictable military technology, these medium range distances are irrelevant as a protective measure [58 p. 75]. It may be argued that with the longer range and more accurate submarine missile systems and their deeper

operating depths, a 200 nm territorial sea could still afford the strategic submarine necessary security. Rapid improvement and increased proliferation of passive acoustical arrays and the construction of an effective attack submarine force could well erase such earlier technological gains of the ballistic submarine. Forcing the submarine into the abyssal plains also denies them the excellent navigation and protection afforded by the topography of the continental shelf, slope and rise.

Of what value are extensive territorial seas to nations that cannot patrol them [2 p. 98]? Governments must realize that the larger their sovereign waters, the more extensive must be their responsibilities in them. This responsibility will include the use of a sea force for policing and enforcing national and international laws.

The traditional concept of the territorial sea as an extension of the national jurisdiction over a narrow adjacent margin of the ocean is being augmented by an additional concept of national jurisdiction over certain ocean activities some distance from the coast [1 p. 12]. This has given rise to the suggestion of an "economic zone" as limited extension of national authority beyond the territorial sea. This proposal would allow a state exclusive use of the resources found within a yet to be specified distance from the shore line. Presumably, the zone would also confer authority to enforce health, customs and pollution measures and, of course, insure a coastal defense zone. The danger

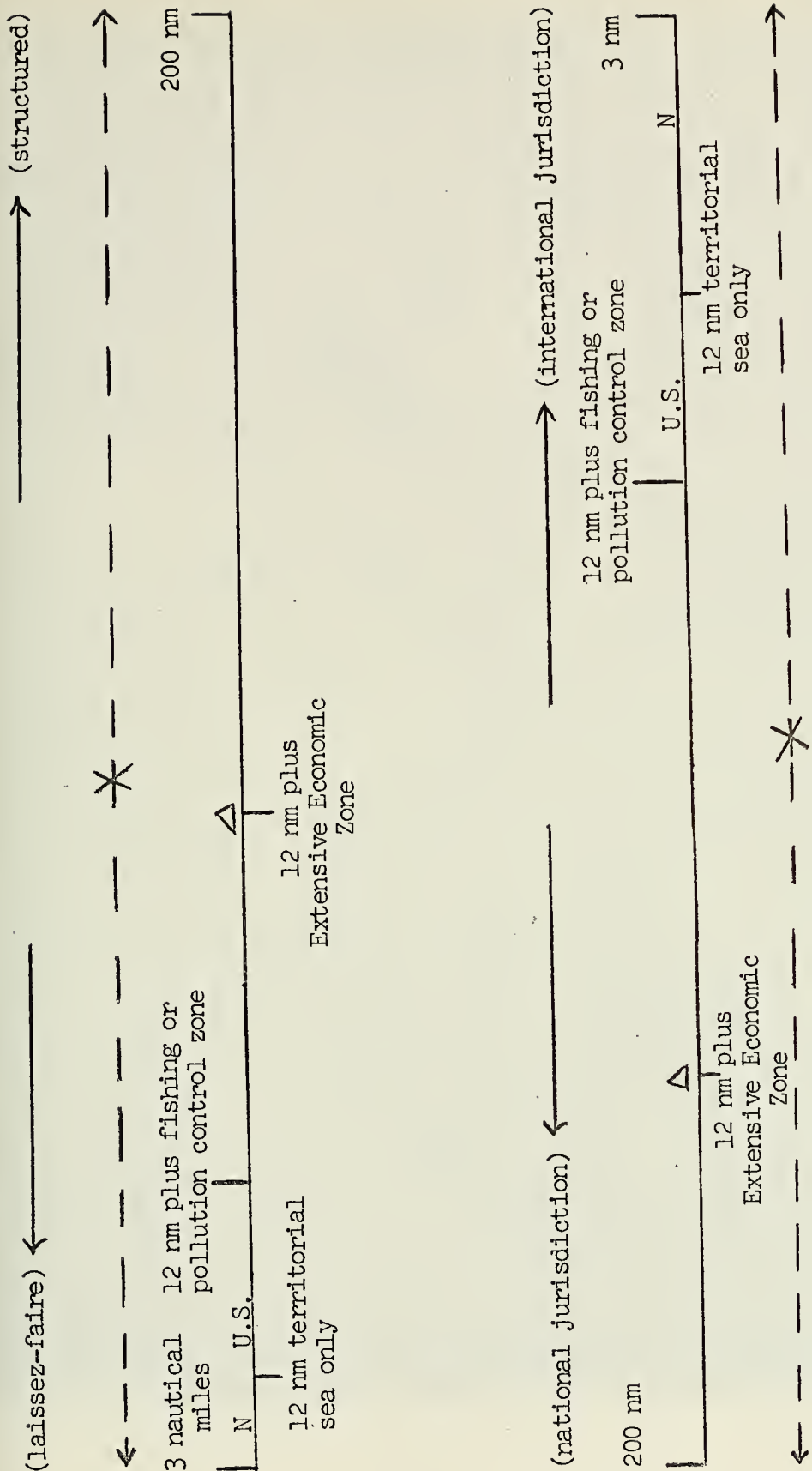
is that this zone would soon become an extensive territorial sea.

At the last preparatory meeting of the United Nations Seabed Committee in Geneva in the summer of 1973, the delegates reached a widespread consensus for a territorial sea of 12 nautical miles in breadth, but only if effective control by the coastal state were assured over the seabed and living resources. It is, therefore, probable that if an international decision on the territorial sea were reached in the near future, a breadth of 12 nautical miles would be the limit. For the U.S. Navy, this universal extension would be an acceptable distance, if the international straits issue were favorably resolved. The United States has other vital interests to be considered, but none which would override the concern for the security of transit and capability of deploying its military forces.

D. SPECTRUM 3: INTERNATIONAL STRAITS

Figure 2 and Figure 8 considered together show the extent and importance of the issue of international straits. Restriction or closure of any number of these narrow passages would have effect upon world economics as well as international security. In the past, international law has utilized the concept of innocent passage [13 p. 347] through those international sea lanes which are within claimed territorial water.

In recent times the growth of large navies, oil fleets and merchant traffic has prompted many coastal states to



SPECTRUM 2:
The Territorial Sea

* legal status quo
 Δ most likely international solution
 U.S. best solution for United States
 N best solution for U.S. Navy



Figure 8. Major World Shipping Lanes
[Office of the Geographer, Department of State]

interpret innocent passage subjectively. It is argued that this is a prerogative of the coastal state in the waters under its jurisdiction [76]. Necessarily, states bordering straits have become more aware of the dangers arising from pollution as a result of intense traffic in the straits. These states are also apprehensive of warships and military aircraft transiting close to their shores. Certainly regulations and their enforcement are needed for safety, efficient navigation and pollution prevention in these congested areas. International standards and supervision would seem to be more advantageous to both the straits states and the vessels using the straits. The adoption of a territorial sea of variable width [2 p. 86] to create a high seas transit zone [56 p. 784] within each strait would facilitate this end. If the creation of this internationally controlled corridor cannot be achieved, the next best solution would be a guarantee by international treaty of freedom of transit for all vessels through international straits that fall within the territorial sea. This freedom of passage would have to be well defined and ensure a vessel of any type or nationality the unhampered right to navigate those designated waters on condition that the flag states observe international agreements and subsidiary standards for environmental protection, navigational safety and international security. The exploitation of natural resources within the straits by the adjacent states will tend to curtail this freedom of transit, making

it more imperative that a non-national solution to the straits issue be adopted [40 p. 6].

The solution of the international straits issue is tied most intimately with that of the territorial seas issue. If 12 nm or more were established as the seaward limit of national sovereignty, the terms of passage through affected straits would have to be determined. No state with a large navy would accept the closure of these strategic channels to their warships, nor would the world's trading nations long tolerate uncertainty of transit for cargoes moving on or over the sea.

With regard to the navies of the United States and Soviet Union in particular, the question of submerged transit of military submarines must be examined. Requiring missile submarines to surface and show their national ensign when transiting these choke points might tilt the delicate strategic balance between those two countries. Shallow waters are difficult and dangerous for the present day large military submarine to maneuver in [19 p. 143], submerged or surfaced. A good anti-submarine sonar net in a strait might appear to invalidate the security afforded by submerged passage [44 p. 780]. This is apparently not so, though improved technology and increased use of ASW systems may change this in the future. In addition, if any type of monitoring system were to be placed in a recognized territorial sea, it would require agreement by the contiguous state [2 p. 80]. Logically many states can be expected to



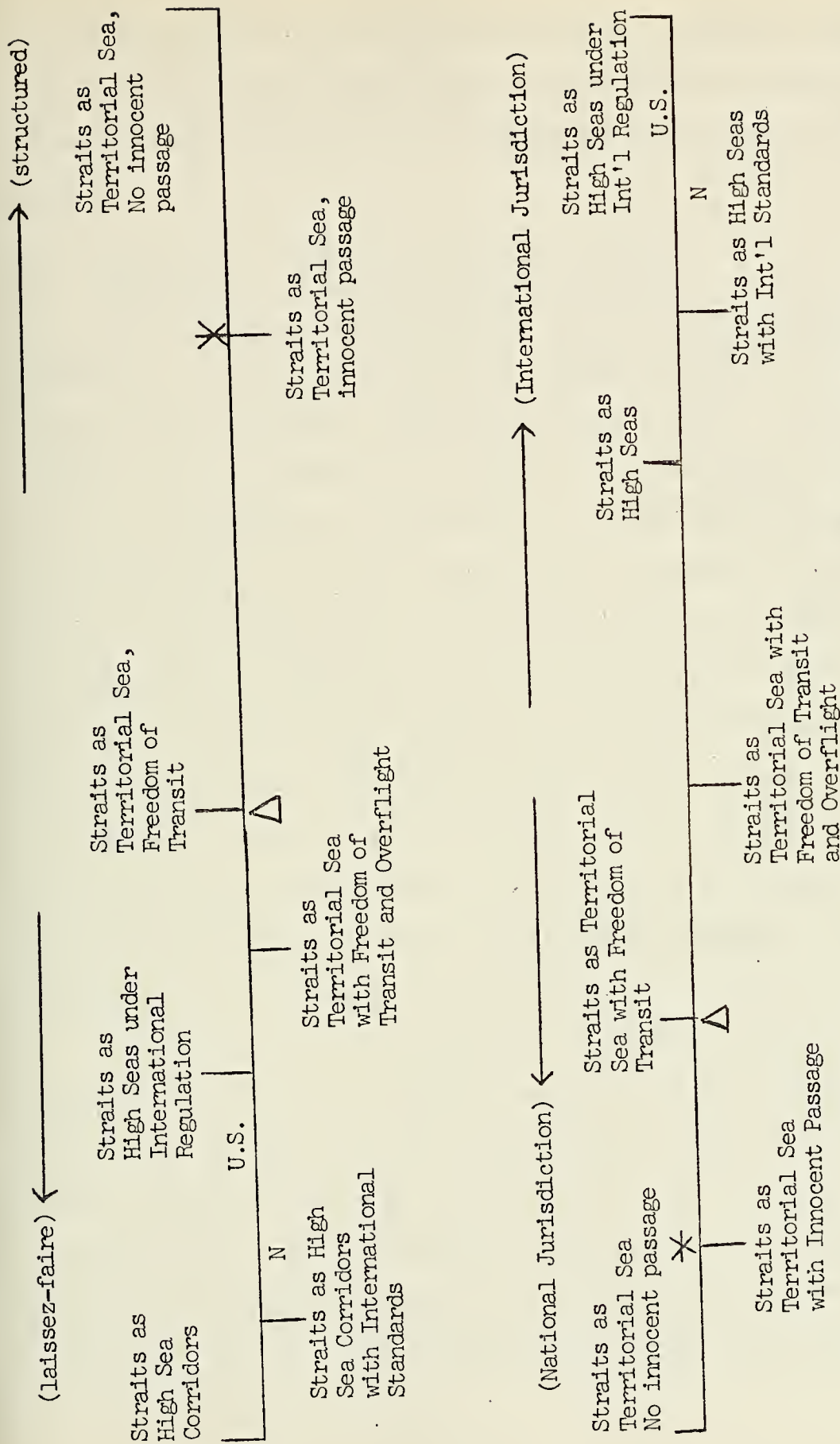
forbid all ASW seabed systems in waters they have jurisdiction over, thus prolonging the tactical advantage of the submarine in these areas. The advent of the commercial submarine, especially ones incapable of surface operations, however, will require precise tracking and control especially in restricted waters. The range of submarine missile systems does not necessitate submerged passage through straits. The value of this submerged transit is to allow the covert movement of strategic forces from one part of the world's ocean to another.

Conventional naval forces would be even more affected by the restriction of movement through international straits. The need to move and move quickly to any given location in the ocean while maintaining efficient logistics lines is necessary in the role of the U.S. Navy as a limited deterrent force. Naval units or whole fleets could be trapped within a water body or at least forced to take longer alternate routes by legal closure of a strait. There is no guarantee that this closure would stop a determined sea force from transiting despite protest. The U.S. Department of Defense is indeed resourceful enough to find alternatives should its free passage proposal be rejected by the international community [44 p. 786]. Unfortunately any restriction of movement through straits would most probably lead to larger, more dispersed national navies together with acceleration of the development of more numerous and potent weapons systems.

There are also disadvantages to the coastal states who would have sovereign control over international straits. The responsibilities of management, navigation, pollution and their own exclusive exploitation of marine resources in these zones would be greatly complicated and increased by the intense marine traffic in the straits. The potential for an unstable balance of military power and conflict are also added burdens upon the strait state which controls passage through the strait [44 p. 777].

Agreement on the international straits issue appears to be the key to unlocking the satisfactory settlement of the territorial sea issue for naval and maritime states, including the United States. Compromise is necessary. Ambassador J.S. Amerasinghe, the UN Seabed Committee Chairman, has stated that this must be "...agreement to no more than the right of innocent passage through straits falling within the territorial sea." [4 p. 19]. This is no compromise at all but the continuance of the present situation. It is unfortunate that an equitable and timely Law of the Sea resolution might be jeopardized by hope for the small victory over free transit.

If any international decision is reached on this issue it will include some form of adequate guarantees for transit through international straits by all ships [11 p. 2]. For the United States this would be the minimum acceptable solution, while the U.S. Navy could accept free transit only for naval vessels and support ships. Increased use and



* legal status quo
 Δ most probable international solution
 U.S. best solution for United States
 N best solution for U.S. Navy

SPECTRUM 3:
 International Straits

dependence on straits by the military and commercial ships of the United States will make it advantageous to have international regulation of navigation and safety in these waters.

E. SPECTRUM 4: MARINE SCIENTIFIC RESEARCH

This issue draws significance at this time primarily because of recent restrictions on marine research in shallow waters near or within claimed territorial seas. The coastal region from the shore to the edge of the continental shelf, at an average depth of 200 meters, provides the most dynamic and potentially valuable ocean area of interest to man. Study of the marine life, non-living resources, geology and water masses of this thin strip of marine environment is necessary for the earliest full use and protection of the oceans as a whole. The establishment of any width for the territorial sea would have a minimum effect on scientific research in those nationally controlled areas if provision were made by international convention to guarantee the scientist basic freedom to study there [2 p. 42].

One reason for the reluctance of coastal states to allow complete freedom of scientific research in the territorial sea or on the adjacent continental shelf seabed is the fear that information gained could be used to the detriment of the coastal state. An increasingly sophisticated world knows that any scientific research can be used both to aid and harm mankind. To place total restriction on all marine research

in waters under national jurisdiction is not justified in view of past experience which indicates that the vast bulk of scientific information is used for constructive purposes. It is not even practical to try to limit modern marine research to designated geographic areas since satellite and aircraft scanning, electronic sensing, seismic pulsing and moving water masses cross these artificial barriers arbitrarily making much in situ sampling unnecessary. Any formula to distinguish between pure scientific research, military research, industrial research or prospecting is doomed to failure in interpretation [4 p. 18]. The United States has advocated that the responsibility for determining whether marine research is to be termed open for international dissemination and not for military intelligence or industrial purposes should be placed on the flag state [62 p. 1024]. This plan is not likely to convince the opponents of freedom of research to change their position.

The 1958 Convention on the Continental shelf was a deliberate attempt by the international community to keep the oceans open to scientific research [33 p. 46], even in waters under national jurisdiction [13 p. 376 Article 5 (1), (8)]. Yet at the last preparatory UN Seabed session in Geneva, only the United States and Russia supported freedom for marine research [62 p. 1024]. A study of the lopsided world distribution of oceanographic research vessels, research funds and marine scientists among a relatively few nations [9 p. 39] is at least one reason for the lopsided enthusiasm on this issue.

For any country to develop its off-shore resources and protect the ecological balance of the coastal environment some form of marine research is necessary. Most undeveloped states at present do not yet have a minimum of this capability. Many unilateral agreements to help them achieve the needed technical expertise, trained operators and equipment have been volunteered by those states adept in the ocean sciences. However, a more palatable and equitable source for this exchange is the international organization. One of the most active in marine science is UNESCO. Through its Oceanographic Office and the Intergovernmental Oceanographic Commission (IOC), a program is in progress to assess the most urgent needs for ocean research of developing coastal states. To best establish any activity in their waters, an international scientific organization must emphasize that it is not taking research but giving information that will help the developing state utilize their marine jurisdiction to the greatest advantage [67].

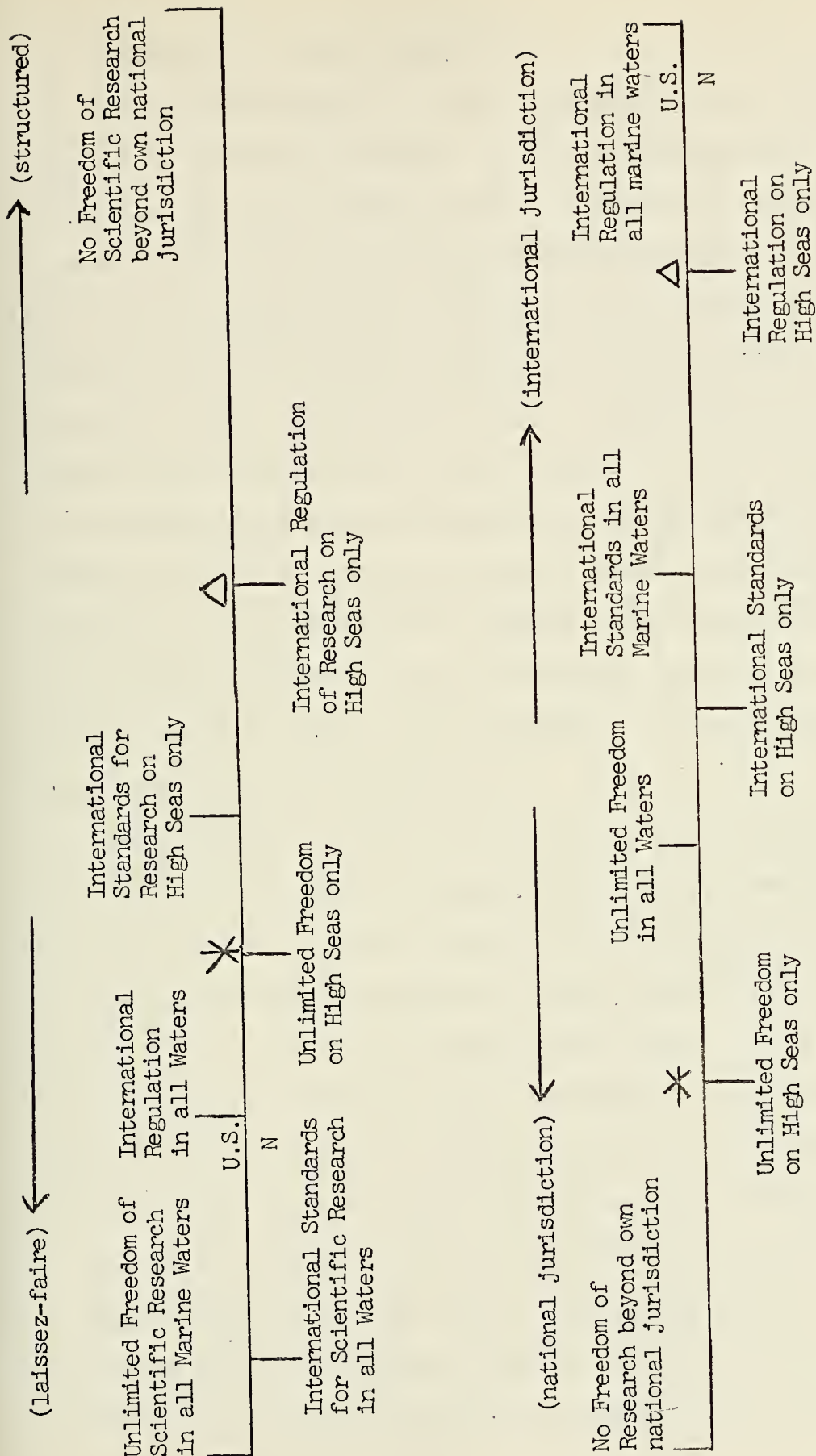
Much opposition to the free access to ocean waters by scientists is based on the fear that information gained will be used for military purposes. Certainly scientific research is necessary for new weapons development, but a defense establishment will find ways to do that research regardless of whether or not the territorial seas of other states are closed for investigation. Especially with regard to ocean borne nuclear weapons platforms, more scientific research is necessary and desirable to make them safer and effective

enough in their role to preclude the need for more of them, bigger missile warheads or more dangerous tactics. The nuclear stalemate is a fact and its maintenance appears to be imperative until a viable alternative is found. If freedom of marine research is made more or less for any given country, then the potential for an equal capability in marine technology for that state, particularly one that is militarily advanced, is frustrated. This could lead to an instability of world power. Any disarmament negotiations between nations must be based as well on sound technical information and assessment which can only be gained by equal access to a maximum of ocean space for research. A system of international monitoring and/or enforcement of ocean laws must also be aided by marine research and technological advancement.

To satisfy efficiently world needs from the oceans, particularly for food, scientific efforts must be coordinated and exchanged between all states. For this reason alone, a central international marine agency is a necessity. International supervision or regulation would ensure the most efficient use of scientific research for the world at large and still permit national marine investigation to continue under tenable standards for safety and equal opportunity for all scientists. The scientific community can aid their own objectives by making clear those needs and goals of research that will be beneficial to all nations and assure their freedom to conduct this research by the free and enthusiastic exchange of the results.

The United States Navy will be affected by any restriction of marine research. The Navy's oceanographic budget alone accounts for over half the total federal budget for marine sciences [74 p. 299]. Much of this budget is directly related to research at sea. The U.S. Navy has accepted responsibility to lead the nation in the development of ocean technology [74 p. 308] and as a result more than 90% of basic data gathered by the Navy is unclassified and freely available to any person for legitimate use [74 p. 307]. It has been recommended that the Navy even expand its present oceanographic research, in particular, acoustics research [20 p. 30]. Worldwide ocean research of particular concern to the Navy involves not only acoustics, but long range environmental prediction and seabed topographic mapping.

The United States and its Navy have both the most to gain as well as share from research coordinated and protected by international machinery over a maximum of ocean area. Having the world's best capability either to gather or utilize scientific information, the United States should urge international cooperation in marine research through mutual sharing and common programs. Nations less advanced in marine activities might feel compelled, out of fear or ignorance, to restrict marine research where they can and have it closely monitored where they cannot. Such reactions may successfully be overcome only through international institutionalization of marine research. The freedom of science as well as the Navy may depend on it.



SPECTRUM 4:
Marine Scientific Research

* legal status quo
 Δ most probable international solution
 U.S. best solution for United States
 N best solution for U.S. Navy

F. SPECTRUM 5: MARINE RESOURCES

Some states might be little interested in the final outcome of the other issues, such as international straits or pollution, but, without exception, all are keenly concerned with the outcome of the resources issue. Perhaps, by the early twenty-first century, marine resource use and exploitation will replace security as the overriding national interest in the oceans [1 p. 11]. A historically abundant harvest and a multitude of uses from the oceans [35 p. 670] have spurred optimistic estimates of the great potential in quantity and renewability of marine resources. Many of these estimates, particularly with regard to living resources, are proving unrealistic and not to have taken into consideration the second order effects inherent in the extensive exploitation of any resource.

Since the resources of the territorial sea and continental shelf to at least 200 meters depth have already been allocated to the coastal states, it remains for a decision to be made on those resources in the extensive water body beyond 200 meters and the deep ocean seabed. This decision will determine how much of the resources of the common heritage will be left to the management of the international regime. The freedom to fish for all nations is guaranteed by the 1958 Convention on the High Seas, but the concept of res nullius is giving way to res communis [13 p. 114] for other marine resources as well. There is no question of whether the deep ocean will be exploited for resources,

i.e., mining, energy generation, transportation, but when and under what rules. The legal facet of the problem is complicated by the fact that the most likely entrepreneurs seeking commercial exploitation of deep sea resources will be large multinational corporations due to the sheer magnitude of expense and technology required to extract resources far from shore. These organizations owe no allegiance to any one nation's laws and will be much stronger financially than many "sovereign" states.

An evaluation of the management of high sea resources by the international regime must include an evaluation of the quantity and diversity of resources that would either be permissible, feasible or profitable under that system. To predict which marine resources will be exploited greatly in the future, each resource must be examined as to its potential value, location in the ocean and methods of extraction. Petroleum, for example, is a crucial resource for any industrialized state. It has proven to be much easier and more fruitful to drill and extract it in shallower water than far out on the continental shelf. Quantities of fossil fuels that are more than adequate to the needs of most nations for the rest of this century quite possibly lie in the sediments of the shelf within their present national jurisdiction (Figure 9) [74 p. 603, 63 p. 301, 28]. Thus it may be impractical to exploit petroleum far out at sea.

Manganese nodules have been greatly overplayed as to their importance. Extensive mining of them may only serve

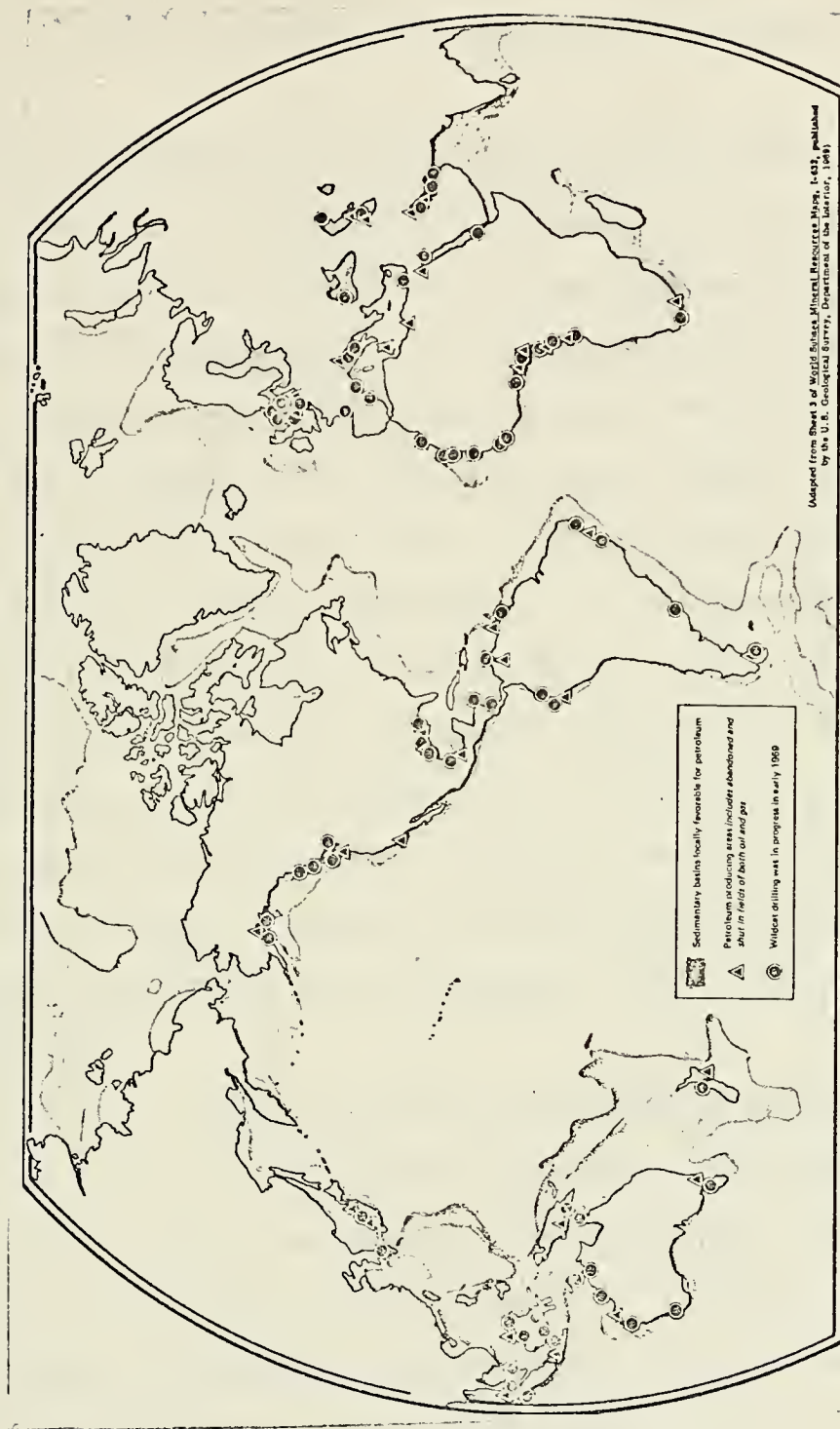


Figure 9. World Subsea Petroleum Potential

to drive down the world market price for manganese, nickel, cobalt and even copper [25 p. 20, 36 pp. 386 and 399 to 416, 63 p. 409] to levels that make it unprofitable to mine the nodules at all.

It is shown by marine geologic study that the most lucrative areas for other mineral resources are also in shallow waters and most likely to be under the exclusive jurisdiction of the coastal state (Figure 10). Although some fish resources are distributed in areas far from coastal regions (Figure 11), marine biologic studies have shown that the primary links in the food chain are concentrated in near shore areas (Figure 12). If the harvesting of phytoplankton or zooplankton is undertaken, the coastal state is again in a position to control the greatest areas of the resource. All this indicates that with any extension of coastal state jurisdiction to resources beyond 12 nautical miles or the 200 meter isobath, the international regime may be left with very little of the potential value of world ocean resources.

In the case of some resources, international regulation and taxation may act to discourage deep water exploitation, while in other casts it may provide the stability an investor demands and the incentive the international community needs to be involved in the direct exploitation of marine resources. An international marine regime may otherwise find itself unable to compete with private industry or national programs. The international regime, however, could find it lucrative to

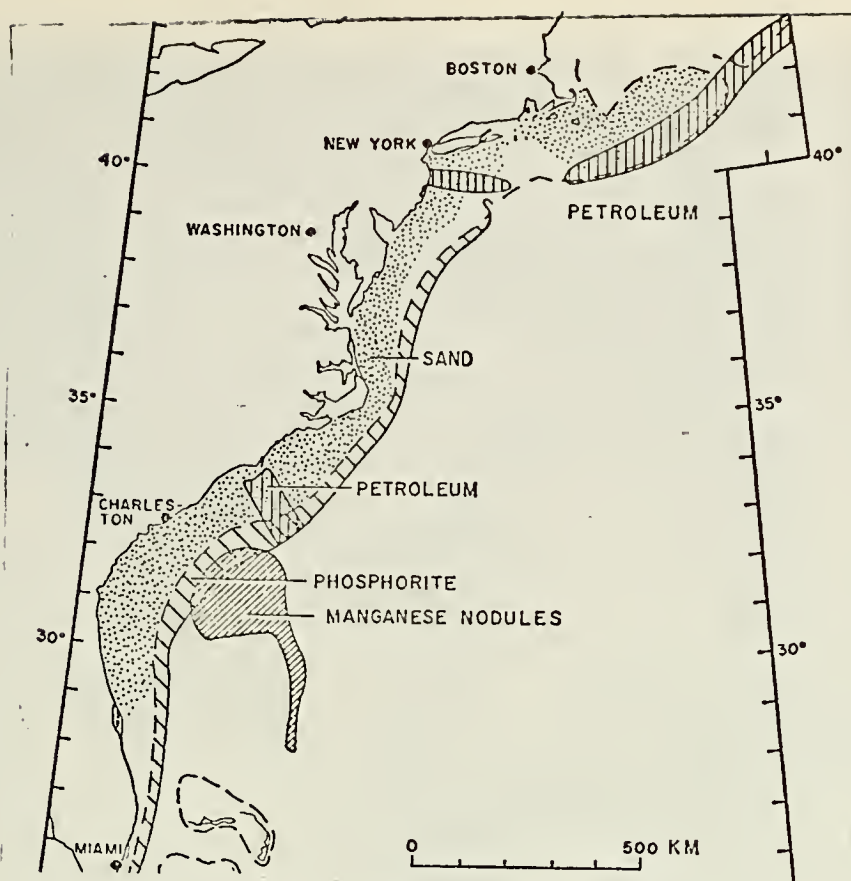


Figure 10. Potential Resources Off the Eastern Seaboard of the United States

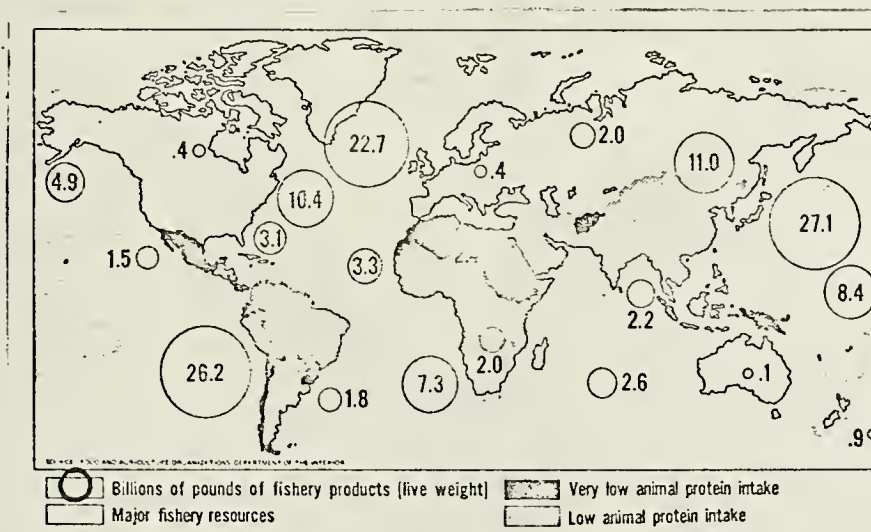


Figure 11. Annual Fishery Catch, Resources, and Areas of Protein Deficiency, 1968



Figure 12. Phytoplankton Production, shaded areas representing degrees of production.
[Office of the Geographer, Department of State]

develop and manage on the high seas floating environmental prediction stations, research platforms, navigational devices and rescue vehicles, investments that most nations singly could not justify.

The establishment of any type of exclusive economic zone beyond the territorial sea [11 p. 2] will also limit the ultimate value of deep sea resources available to international control. In proposals so far, including the U.S. 1973 draft treaty articles, entitled "The Rights and Duties of States in the Coastal Seabed Economic Area," the Santo Domingo, Yauonde and Kenya Declarations of 1972; the jurisdiction of the coastal state in this zone has not included any interference with the high seas rights of navigation or overflight and other activities not forbidden by international law [4 p. 4, 65 p. 401]. The United States' concept of the economic zone as a trusteeship administered by the coastal state provides for a revenue tax of from 50% to 66 2/3% on all resources exploited therein. These funds are to be used in aiding the developing countries [4 p. 14]. While the economic zone would be most valuable to the coastal states and the trusteeship alternative a practical means of sharing the common heritage of mankind with developing states, these extensions of resource jurisdiction is felt by many, including the military, to be creeping acquisition [34 p. 152]. The U.S. Navy could potentially be faced with the same problems with the economic or trusteeship zone as it would face with an extensive territorial sea.

Any disagreement or competition in exploiting the resources of the seas beyond national jurisdiction will involve navies. Competing claims to ocean fish have often led to international conflict, as the British Navy has experienced in recent years off Iceland [5 p. 12]. The identification of a mineral resource on the bottom of the high seas could also easily result in the congregation of several competitors [21 p. 35]. To protect far flung deep sea mining stations or oil rig platforms from possible harassment or sabotage would involve great flexibility in the character of naval operations. Presently there are over 21,000 structures involved in oil and gas recovery in the Gulf of Mexico alone [31 p. 38]. Submerged continental shelf installations and pipelines would also pose a formidable defense and policing problem for national navies. With an effective international regime this might not be as necessary, but sovereign states do have now the right to control and protect marine activities under their flag or nationality, including resource installations [15 p. 42, 65 p. 399]. Even where the U.S. Navy may consider an area of the world unimportant from a purely military point of view, it may have to devote its attention to that area due to the value of marine resources there [50 p. 4]. In the future many structures for the exploitation, transportation or storage of natural resources will be on the seabed [9 p. 20]. These are certain to lead to a conflict of use in the water volume that most likely will result in resource activities

being given the privileged status. The Netherlands North Seas Installations Act of 1964 took this one step further when it unilaterally extended criminal jurisdiction to all sea installations erected on the continental shelf outside of territorial water [21 p. 38].

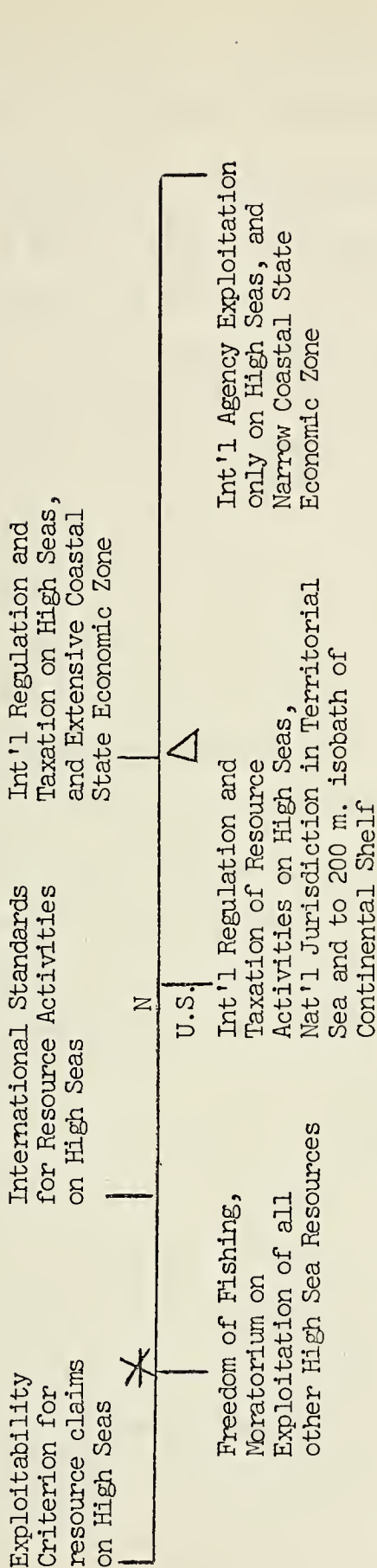
The U.S. Navy will also be indirectly affected by the outcome of this issue by the fact that its operations are heavily dependent on adequate supply of most of the seventy odd strategic materials, most of which can be found in the sea. Without a sufficient supply of these materials, the Navy would have to find other means to carry out its mission. At best technology would again be called upon to fill a critical need, as during World War II, when the lack of natural rubber forced the rapid development of the synthetic. At worst a reduced operational capability or alteration of strategy might also be required.

For the United States as well as the Navy, petroleum is likely to remain for the next 20 years the most valuable mineral resource available from the marine environment. With the exception of the nuclear submarine fleet and 11 surface ships, including three aircraft carriers [22], all U.S. Naval vessels and aircraft are propelled by some form of fossil fuel. Without imported or marine sources of oil, the U.S. Navy would have to compete with all other domestic users for the nations' known land reserves of 38 billion barrels, 4.5 billion barrels of which is estimated to be in Naval Petroleum Reserve #4 in Alaska [61 pp. 208 to 212].

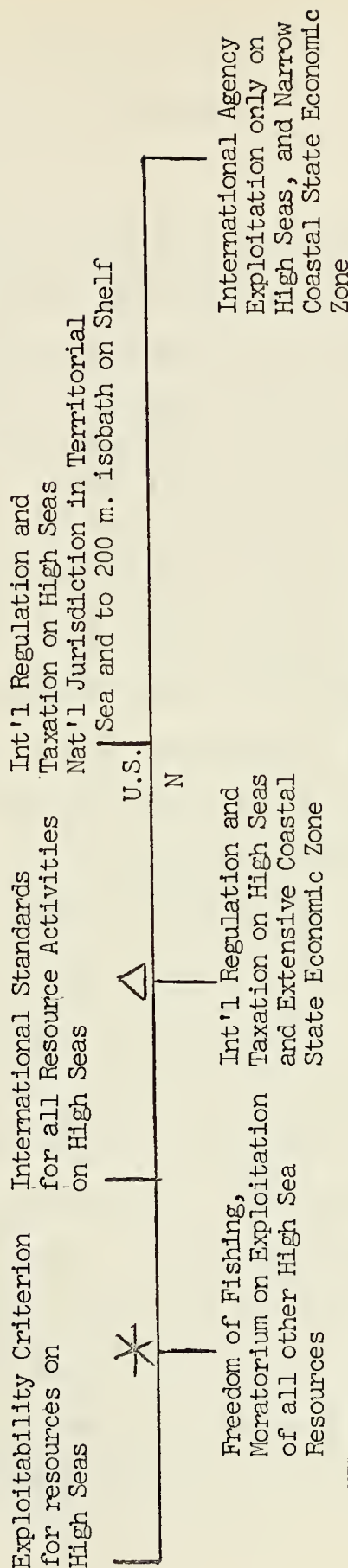
Even if a major transition is made afloat to a nuclear powered force, aircraft will still no doubt, be dependent on fossil fuels. Recent seismic profiling by Dr. Grantz of the U.S.C.G.S. on the Alaskan Chukchi shelf indicates the presence of geocynclines most indicative of petroleum deposits [28]. The discovery of anything on the order of magnitude of hundreds of billions of barrels [61 p. 212] in these shallow waters would allow the United States and the Navy the independence and security it desires to get through the petroleum age.

International regulation of all high seas' resources appears imperative. A standard of exploitability as the only criterion for resource claims on the high seas is inadequate. Increasing proliferation and variance of national standards for marine resource extraction will prove useless in maintaining a peaceful and equitable ocean order. International regulation over the deep sea resources and competing demands for exclusive national resource domains are both increasingly likely in the future. For the United States, a minimum of national jurisdiction over coastal resources and the regulation of the deep sea resources by an international authority would be most advantageous because American enterprise is most capable of exploiting marine resources world wide. The U.S. Navy would also be better served by a minimum extension of coastal states' exclusive controls beyond the territorial sea. International regulation of resources also promises the

(laissez-faire) ← ————— → (structured)



(national jurisdiction) ← ————— → (international jurisdiction)



SPECTRUM 5:
Marine Resources

* legal status quo
 Δ most probable international solution
 U.S. best solution for United States
 N best solution for U.S. Navy

best opportunity for settlement of conflicts before the resort to violence involves the use of sea forces.

G. SPECTRUM 6: MARINE POLLUTION

A basic tenet of national defense is that of protecting the state against harm or threats to the environment [58 p. 73]. The 1958 Geneva Convention on the High Seas places the responsibility for the prevention of marine pollution on the states themselves [13 Article 24, 25; 78 p. 93]. This has led to an inconsistent growth in national pollution standards and regulations. Some countries have none, while some have extensive laws in force, such as the Canadian Pollution Act of 1970. The first comprehensive international pollution standards have only recently been promulgated in treaties (see pollution issue section) and articulated in international organizations, such as the Intergovernmental Maritime Consultative Organization, UNESCO's IOC and the International Atomic Energy Agency [37 Article III(6)]. Until standards are universally accepted and faithfully observed by the great majority of ocean users, their value will be questionable. Naturally, the worst offenders are often the last to conform. National regulation and enforcement of pollution controls in territorial waters and internal estuaries and rivers appear to be most important measures available, because the great bulk of marine pollution originates and remains in the coastal zone, particularly near urban areas. Yet, since ocean currents and winds eventually

make one nation's pollution every nation's pollution problem, it is imperative that some international system be responsible for the stimulation and development of international and national regulations to control polluting activities. At the minimum, international standards for pollution control on the high seas should be enforced by each state in their own waters and aboard ships either under their flag or nationals. Eutrophication from garbage and sewer dumping, toxic concentration of chemicals in sea food, massive erosion and silting of coasts and estuaries, and widespread oil slicks are a few of the more obvious results of national and international policies that are unresponsive to the harm or threat of marine pollution.

The United States Navy is not only concerned with the pollution it causes, but also with the harm that pollution could cause to the Navy's ability to operate effectively. The mission of the Navy is to protect the interests of the United States in the marine environment. Unacceptable pollution of the country's environment by naval activities is in direct contradiction of that mission. In addition, marine pollution can cause equipment, ship and human degradation, jeopardizing safe and efficient naval operations. Many obvious pollutants from naval vessels have long been identified. Among them are: spills of oil, paint and chemicals; discarded equipment, explosives and garbage; and dumped heat and sewage. Navy directives now require better disposal of these wastes, but much remains to be done in order to minimize pollution.

In recent years radioactive material has increasingly appeared in the seas as a result of weapons fallout, the mining and processing of nuclear products, the improper handling of nuclear wastes and accidental discharges [13 p. 142]. The Nuclear Test Ban Treaty of 1963 and the Nuclear Non-Proliferation Treaty of 1970 [13 p. 200] have no doubt helped slow the increase of this marine pollutant, but the promise of off-shore nuclear power plants and the extensive use of nuclear powered ships could reverse this trend. The U.S. Navy alone will have 136 nuclear powered vessels at the end of a current building program, including 11 surface ships and one deep submergence research vessel [22]. Many seemingly harmless substances have yet to be recognized as pollutants. For example, a copper defouling paint used on Navy ships seemed to be a success until it was discovered that it was lethal to harbor marine life when a large ship remained in port [30].

Military organizations and activities have not always been thrifty in their material usages or adequately concerned with their effects upon the environment. Today, in time of peace, provisions and efforts must be made to temper or reverse undesirable side effects. In some instances, the Navy's access to new technology and funding has led the way to techniques and programs for pollution abatement and their application to the private marine community. The Naval Research Laboratory's "oil herder" is one example [30]. Many projects of the Naval Civil Engineering Laboratory are

also directly related to environmental protection. The Secretary of the Navy in conjunction with the Environmental Protection Agency and Department of the Interior annually conducts Navy wide competition to determine those ships and bases that have contributed most to the preservation of the environment [17 p. 14].

The pollution problem is used as an argument for justifying the exercise of metropolitan jurisdiction over international straits and some enforceable, effective regulations over high sea marine activities in an international court. Attempts are underway in international negotiations to include military vessels under pollution control regulations. The United States has consistently maintained that public vessels be exempt from any pollution prohibitions, but act in accordance with treaty standards. Since naval vessels only account for a small part of marine pollution, countries without large navies might be demanding that warships be included in any pollution conventions as a means to harass or restrict the activities of those states with large navies [54 p. 31]. Thus, in order to help secure and maintain freedom to operate unhindered in international straits and on the high sea, the U.S. Navy, above all others, must demonstrate its willingness and ability to prevent or counter marine pollution.

Man's increasing activity on and near the oceans and the concomitant environmental pollution require that higher international standards become enforceable regulations and that all nations cooperate for their implementation nationally

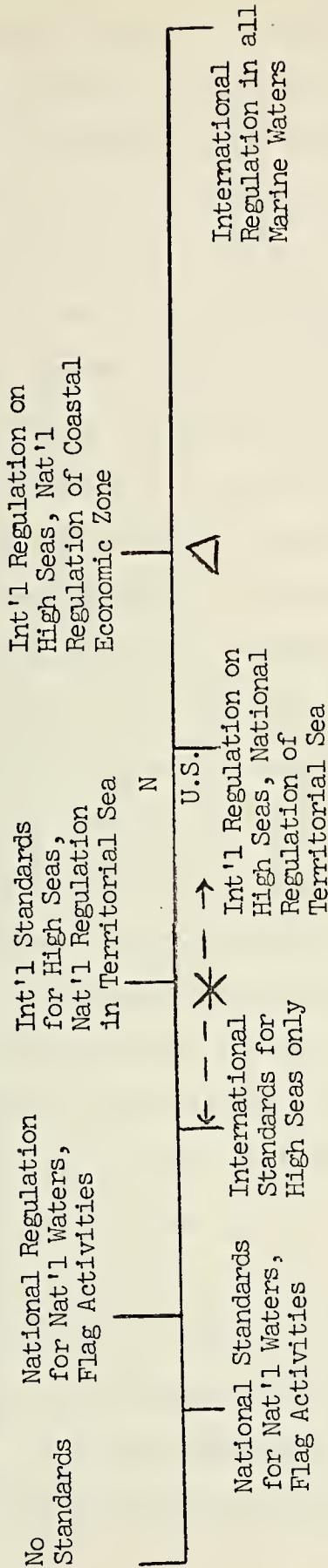
and internationally. For both the United States and the U.S. Navy international pollution regulation on the high seas is desirable, because they stand to lose the most from a fouled marine environment and indignant governments unilaterally proclaiming self-serving protective legislation.

H. SPECTRUM 7: THE INTERNATIONAL REGIME

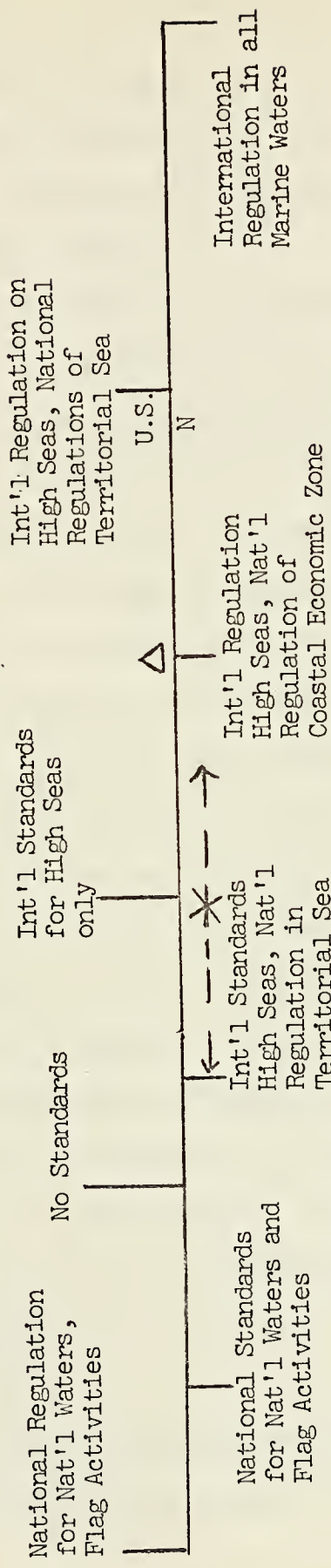
The spectrum extends over four basic forms of international regime: (1) a vacuum beyond the limits of national jurisdiction, (2) the division of the entire world ocean among the coastal states, (3) flag state control of its own maritime activities on a first come, first served basis and (4) international governance of the high sea and deep ocean seabed [55 p. 83]. The solutions on the national to international jurisdiction spectrum are from left to right illustrating the evolution from national regimes to an encompassing international regime over the entire ocean with regional solutions intermediary along the way.

A world system composed of national regimes might at first seem to be the most hospitable for a national navy to operate, especially if those national regimes agreed to a limited territorial sea and extended only to flag activities on the high seas. A series of bilateral agreements might then suffice to allow a worldwide navy, like that of the United States, a maximum of freedom. However, the ever-changing, conflicting and overlapping policies of many nations could make it most difficult for vessels or

(laissez-faire) ← (structured)



(national jurisdiction) ← (international jurisdiction)



✗ legal status quo
 Δ most probable international solution
 U.S. best solution for United States
 N best solution for U.S. Navy

SPECTRUM 6:
Marine Pollution

organizations to operate, whether in a territorial sea or on recognized high sea. The myriad of complicated regulations and disparate claims which would be inherent in a world of over a hundred competing national regimes would be the most restrictive to the U.S. Navy in the long run.

A multilateral regime seems preferable to bilateral arrangements for both the U.S. and Soviet Union [44 p. 785]. Further, multilateral regimes based on regions created by a common sea, coastline or continent seem to be an expedient form of transnational ocean management [16 p. 3], but may be objectionable to excluded states with rights in the area. A Mediterranean regime [39 pp. 59 to 87] and North Sea regime have begun action based on national needs respecting a common sea. A Caribbean regime has also been initiated. After Canada's unilateral pollution initiative in the Arctic, the United States proposed a nineteen state conference to discuss common regional problems of the Arctic region [46]. Each of these may serve as examples for other regions fused by a necessity to meet common, local needs. The United States Navy already operates in the waters of every potential regional regime and under this system would have to adapt its activities to the regulations of each region. At best, this mosaic of marine legal environments would be costly, inefficient and hazardous for the world's economy as well as any worldwide national Navy.

The development of separate regional regimes might not exclude the possibility of agreements among regions for a

more effective and consistent ocean order [41 p. 16].

Obviously, the activities and regulations of regions ought to be within the framework of general international law, including custom, and not in conflict with it [39 p. 166]. Thus, an international structure is essential in order not only to avoid harmful regional discrimination, but to harmonize desirable regional cooperation with global interests.

A composite of structures might be most easily accepted by a majority of nations. Each state would have complete jurisdiction over its territorial seas and within its continental shelf seabed to the 200 meters isobath, plus explicitly enumerated privileges in an established economic zone. Several regional regimes might manage or exercise regulatory authority over deep ocean and seabed resources, pollution and navigation, but without denying other states their otherwise inherent rights. These regimes might handle truly regional problems that may arise, subject to the oversight of global international agencies. At a minimum, the global agencies or a world regime could coordinate the activities of the regions and set worldwide standards. Although offering advantages over exclusively national solutions, the regional regimes cannot fulfill the need for worldwide solutions. If regionalism hastens the emergence of a global regime they will serve a great purpose. If they become obstacles to transit and trade, they will have to be reduced or subsumed by a world ocean regime, for the ocean is an indivisible whole.

An effective, centralized international regime for the world ocean has stimulated much imaginative thought in modern international law. The world ocean regime, perhaps an autonomous, specialized agency of the United Nations, could be the common thread that ties together otherwise partial solutions to each of the other ocean issues. Diverse international agencies have been established to coordinate or even govern a special sector of activities, such as mail handling and human health or monetary policy and developmental loans. These organizations are created and limited by the common needs and respective interests of the national participants. It is then apparent that too specialized an agency or even a coterie of little agencies cannot cope with problems of such magnitude as found on the world's oceans. Agencies like the IOC, IMCO and Food and Agriculture Organization of the United Nations are insufficient to constitute a global regime for the ocean [25 p. 84]. The international regime must have the capability to influence the conservation, development, transit and security of the world's ocean resources [9 p. 28]. Since the regime will have a better chance of success in pollution control, conservation and marine safety, it should probably first emphasize those goals [39 p. 174]. A truly international regime could guarantee universal recognition of license and lawful privileges as well as provide common regulation and monitoring of all marine activity. However, the world

regime must not ignore the possible importance of military activities or leave them out of its purview [9 p. 3].

Because of the unique nature and size of its tasks, this marine authority will most likely be based on new precepts, alien to conventional governing bodies. New divisions of power and modes of decision making must be explored. Traditional procedures even within national states sometimes do not suffice to govern disparate groups. In order to create a community of interest among "sovereign" states and the many groups on the globe making up a significant sector of human economic life, untraditional institutions will be needed. Elizabeth Mann Borgese has described one fresh approach for the international organization of the ocean. Her ideas and those like it place emphasis on the functional aspects of the ocean rather than the geographic divisions. The Borgese quadripartite plan provides representation to a Maritime Commission, Assembly and Court. The latter would "ensure the rule of law in the interpretation and application of the law of the seas" [9].

Military organization may have analogies for the new ocean regime. It might prove administratively easier for national navies to cooperate with this new form of ocean governance than to work bilaterally with numerous national agencies. National marine organizations in general should ordinarily find it easier to deal with an impartial international seabed regime than to deal bilaterally [34 p. 152]. An international regime would be a more consistent, reliable

and acceptable system under which to operate a sea force. Armed Forces would be in a more familiar setting operating within the encompassing and binding order of a single ocean authority than one characterized by the assertion of separate national sovereignties.

The United States government with the full support of the Department of Defense has backed the establishment of a generous and strong international regime [34 p. 153] because each have much to gain from a stable ocean order. Some maritime and naval countries, including the Soviet Union [27 p. 6] oppose such a regime, seeing in it a potential threat to state jurisdiction on the high seas. This opposition may delay the inevitable transition from the nation-state system and regional arrangements to the first operational experiment in world management, the international ocean regime.

V. THE PRESENT AND POTENTIAL DUAL ROLES OF THE
U.S. NAVY IN A FUTURE OCEAN REGIME

No matter where solutions may fall on the preceding spectra, it appears certain that present trends among nations are not producing worldwide disarmament and that the use of the oceans by military forces will continue [1 p. 13]. This likelihood makes it imperative that the future international ocean regime include provisions for the peaceful use of national military forces, that is, stipulating impermissible activities and the enforcement of such prohibitions, while leaving the rest as free and legitimate under conditions of peace.

The future seems clear: the U.S. and USSR will continue their exercise in balancing military capabilities, each knowing that too much or too little military power may encourage the enmity of potential enemies [49 p. 219]. The large naval maritime oriented states meanwhile will tend to extend their ocean policy objectives beyond those of trade, transit, communications, fishing and national security to include new capabilities of exploiting vast marine resources and acquiring greater political influence [32 p. 24]. Many states will add to their marine inventories such equipment as unmanned underwater vehicles, surface and midwater buoys of all types, submersible aircraft carriers and tankers, high speed surface effect vehicles, deeper and faster submarines, manned underwater habitats and floating midocean

bases [2 pp. 83 to 90]. There will also be other vehicles and devices not yet conceived. Although general war appears more and more unlikely between the major world navies, limited wars among smaller naval powers remain a distinct possibility [2 p. 84]. The changes in the methods of military operations as a result of technology [50 p. 7] will increase greatly the relative strength of small navies [2 p. 83]. Their future marine inventories will include numerous small submarines, highly armed missile patrol boats and prolific acoustical systems, all primarily for use in the nationally dominated coastal zone.

A new form of force to be reckoned with by states and the international ocean authorities is that of terrorists. Even now small militant organizations are violating the rights and taking the lives of civilians of all nationalities, including businessmen, athletes, airline passengers and diplomats [7 p. 4]. Anonymous warfare and international blackmail are made easier with today's technology. For example, artificial tsunamies in coastal waters and seiches in estuaries could be initiated by well-placed underwater explosions [2 p. 90]. Nuclear or conventional mines could secretly be sown in restricted waters and triggered by telemetry [49 p. 206]. Even a nuclear sea force cannot defend with 100% confidence an off-shore nuclear reactor against sabotage by guerrillas [7 p. 8]. Pressure and coercion by militant bands and fanatical groups against many sectors of society appears to be growing and reaching out

to threaten the macro-economy and very notion of international community. Clearly, marine resource exploitation could be seriously affected by excessive violence. A sense of solidarity and economic sense must prevail among interest groups as well as governments if peace and security are to be achieved.

The promise of macro-technology, such as weather modification and geophysical warfare will also require some form of international monitoring and governance, if it is not to threaten peace [7 pp. 6 to 14].

In order to be effective, then, any international ocean regime must be given operational functions as the basis of its authority over 140 million square miles of ocean. A system of maritime satellites [10 p. 15] and buoys to monitor the seas, now being considered by IMCO, is a desirable example. Its operation would not likely expose significant national secrets of legitimate military forces [10 p. 45]. One such project is already in operation. The first Earth Resources Technology Satellite (ERTS) included the participation of thirty-seven nations and two United Nations agencies. The data, which are useful for resource research, safe navigation and monitoring pollution, are entirely in the public domain [10 p. 14]. This project suggests to many that in the future all ocean activities can be routinely monitored by an international consortium. This capability might at least encompass traffic control, search and rescue and pollution monitoring [35 p. 665]. In addition to

conducting passive sensing, and perhaps international peace-keeping observation, future international ocean authority might establish an "ocean guard" prepared to assist any ocean users to cope with natural disasters or man's unlawful transgressions [75 p. 3]. The Intergovernmental Sea Service (ISS) envisioned by Ambassador Pardo of Malta would create such a "guard" by contracting with participating states to loan men, equipment and vessels, including those of the military, for international use [39 p. 185]. The IOC has established a precedent by utilizing volunteered national vessels and research equipment for most of its activities [39 p. 195]. If an international sea guard were to be used for monitoring all naval activity, it would have to obtain the cooperation of the most advanced navies to ensure that the "guard" functions at a high technical level [18 p. 86]. In return, the ISS would contribute to the accomplishment of every national navy's first legitimate mission: keeping sealanes secure for peaceful maritime use. Additionally, the ISS's civil and military sources throughout the world's oceans would normally provide national navies with rapid and important assistance for navigation, safety, rescue and environmental information [49 p. 213].

Thus, it seems advantageous that national navies, including that of the U.S., participate actively in a new ocean order. The role of navies as tools of national policy and international diplomacy is well recognized. As long as world politics are conducted primarily by nation states and

their governments have conflicting interests, those tools will be maintained. Acting to fulfill their responsibilities, national navies cannot remain apart from successive steps in the international process leading to the reformation of the international ocean regime with one or more global organizations. However, these powerful and expensive forces are themselves contributors to an international regime of the world ocean and most, if not all, would benefit from a stable and viable Law of the Sea. The role of navies as tools of peace and order ought, consequently, to be cultivated. This role involves the extension of naval functions from those of offensive and defensive sea forces to providing civil-oriented services and assisting with ocean management [39 p. 168]. Herein is the dual purpose agent [7 p. 2].

Respecting the marine environment, the navies, in particular the worldwide and highly technical navies, can be employed by their governments to support any new ocean regime. Navies can readily provide the monitoring, policing, administrative, technical and research capabilities needed to manage such a vast domain as the world's oceans. All navies have the men, ships, materials, technology and experience to participate at once in the dual roles of peacekeeper and peacebuilder. The United States Coast Guard is an excellent example of a sea force with dual roles: the primary one is that of a law enforcement and maritime services agency; the secondary role is that of providing a combat capability whenever needed. The present capabilities and

future plans of the Coast Guard lend themselves perfectly to the support of both national coastal and international ocean regimes. However, the Coast Guard and the equivalent services abroad are limited greatly in terms of manpower, finances and equipment and could not unaided carry out management and patrol tasks for an ocean regime all over the globe. Together the U.S. Coast Guard and Navy could form an efficient team, with the former having precedent in near shore activities and the latter precedent in the deep ocean and distant activities. By comparison to civil agencies, national navies are a bank of valuable assets capable of profitable investment in an ocean regime.

The use of the military for dual roles is not an untried concept. Many countries, particularly the less developed, have learned to use their military forces extensively in peacetime for a variety of civil projects. Most do it of necessity, making best use of capabilities of the military service and unable to afford the costs of ready forces in peacetime. In the United States as well, the Army Corps of Engineers has a long history of civic action, while other military units provide medical assistance for safety, traffic education, youth camps and vocational housing renewal.

The United States Navy has always been active in a dual role capacity adding oceanographic research and marine technology to their combat readiness. The Navy sponsored many early oceanographic expeditions, such as that of Lt.

Charles Wilkes to the Pacific in 1838. Today's U.S. Naval Observatory and Hydrographic Office was established in 1830 as the Department of Charts and Instruments [74 p. 297]. In 1915, the Navy stimulated the creation of the National Advisory Committee for Aeronautics [35 p. 653]. Since World War II the U.S. Navy is the greatest naval power in history with a diverse fleet that currently includes 145 submarines, over 300 destroyers and at least 15 carriers [29 p. 183]. In 1973 the Navy's oceanographic budget of some 250 million dollars accounted for 38% of the federal budget for the marine sciences, although, this was much reduced from the high of 58% in 1969 [75 p. 123]. Less than 25% of this marine science budget was used directly for national security [56 p. 15]. The rest of the Department of Defense also conducts a substantial portion of the oceanographic research for the benefit of the nation [56 p. 159].

As previously mentioned, the U.S. Navy has accepted responsibility as the government's leader in ocean technology [74 p. 308], especially for the deep ocean. All government agencies and oceanographic research centers are able to use naval facilities when they are available. Moreover, the opportunity for civil applications of ocean technologies is often identified from experience with defense projects [20 p. 7]. The continuing Navy program in geodesy and mapping serves all mariners, because all such data are disseminated through the National Oceanographic Data Center [65 p. 170]. Cooperative field surveys are also conducted

between the Navy, U.S. Geological Administration (USGA) and the U.S. Coast Guard [56 p. 172]. In the 1950's the Navy began new projects with a decided civil relevance, namely: a sea-ice forecasting system; Project Magnet for a worldwide geomagnetic survey; a Texas Tower placed off Cape Cod for environmental studies; the Optimum Track Ship Routing Program; and participation in the polar oceanographic studies of the International Geophysical Year (IGY) [74 p. 298]. In 1966 the Naval Oceanographic Office inaugurated a marine sonar prediction system called the Antisubmarine Warfare Environmental Prediction System (ASWEPS) [56 p. 168]. The forecasts include data useful to the civilian community, such that the Bureau of Commercial Fisheries uses ASWEPS to optimize and manage fisheries [74 p. 308].

Recently, Navy efforts have been directed towards the study of comprehensive acoustic and satellite marine navigation systems; ship material development; and the detection of underwater nuclear explosions. This latter system provides extensive seismic data for earthquake research, illustrating how difficult it is to separate the military and non-military uses of any scientific research [56 p. 171]. Besides having almost thirty major oceanographic vessels [56 p. 257], the U.S. Navy has launched a nuclear powered research submarine, developed an undersea recovery system using Deep Submergence Rescue Vehicles (DSRV) and established a Large Object Salvage System (LOSS [56 pp. 174 to 176]. The Navy's man in the sea program has been highlighted

by the SEALAB experiments, which have maintained large groups of men and a few women in deep ocean habitats for long periods of time [21 p. 36]. Several types of high speed surface craft are being tested by the Navy [17], including a 35 ton hydroskimmer built for amphibious operation [56 p. 171]. Of course, the Navy has other platforms suited to scientific research and policing activities such as fixed winged aircraft, helicopters, buoys, spacecraft and ice islands [74 p. 304]. The overlapping capabilities of these platforms also afford the kind of system needed by an international authority to detect, for example, oil discharge from a ship on the high seas at night [78 p. 96].

Internationally, the U.S. Navy is actively participating in the International Hydrographic Bureau and cooperative oceanographic studies, such as the Indian Ocean Expedition [33 p. 47]. It is conducting extensive ocean surveys in conjunction with the United Nations Economic Commission for Asia and the Far East (ECAFE) which also serve defense purposes [56 p. 173]. The U.S. Navy educates foreign nationals in marine science programs and, upon the request of foreign governments, volunteers its services for specific research tasks [74 p. 307]. Since World War II, multinational task forces have become commonplace under NATO, UNESCO and ad hoc sponsorship of scientifically oriented groups. But one first for which the U.S. Navy has reason for particular pride is the mixed manning of a modern sophisticated warship,

the USS Ricketts with nations from six NATO countries, responsive to a proposal of President Kennedy.

The above-mentioned contributions to the peaceful and orderly use of the oceans are not well known, while the U.S. Navy is often criticized for not contributing more to the civilian community in the way of social, scientific and economic benefits from naval technology and research [49 p. 219]. Actually more than 90% of basic scientific data of all types gathered by the Navy are unclassified and available to any legitimate user [74 p. 307]. Most data gathered by civilians are obtained under contracts provided by the Office of Naval Research (ONR). The second order effects from the production and maintenance of naval equipment and vessels are diffused throughout the nations' economic system [7 p. 10]. National defense may thus contribute to the resource creating ability of the nation and its people [35 p. 657].

Cultivation of a peacetime, creative and productive role does not imply that the U.S. Navy or any other naval service sacrifice its priorities or capabilities as a peacekeeping, combative force. The dual roles concept does arise from the realization that the naval mission to keep the peace and promote the nations' interests can best be achieved by making the optimal use of its men, equipment and organization in times of peace or war. This concept requires an expansion of the peacebuilding role. Any newly acquired functions, however, must avoid the weakening of the peacekeeping sea

force role, which remains essential to the achievement or preservation of maritime peace and peacebuilding power [69 p. 12].

In this era which is "beyond peace and war" [7], the United States Navy must learn to achieve or preserve its effectiveness under new conditions. The need today and tomorrow for a strong Navy may not be as obvious as it was in past periods of tension and conflict; the nations' political and financial commitment to a sea force may wane. The smaller Navy that may result will require a review of all naval roles [64 p. 146]. Further success with the Strategic Arms Limitation Talks would place upon the Navy even greater responsibilities for the maintenance of America's nuclear deterrent. Even mutual balanced force reductions would leave the Navy a heavier role in order to deter more conventional violence. For the United States, rapid response capabilities and useable political-military power demands sustainable ocean passage and adequate local control of the high sea [29 p. 183]. Small diverse ships useful to many types of missions will be needed by the U.S. Navy, not least to show the flag and counter international threats to the peace or unlawful terrorist operations [64 p. 150]. Such vessels, which are the most numerous elements in probably all national navies, lend themselves perfectly to the duties of dual roles.

The burden of added responsibilities usually implies added funding. The U.S. Navy should commit itself to the

dual roles concept and advocate its implementation. Some newly acquired systems may add little or nothing to the combative role, but the acquisition of other new equipment for peacebuilding will be useful or essential for peacekeeping. Most of this equipment the Navy would like to acquire anyway [64 p. 147]. However, the development of capabilities for the conduct of dual roles should not be an excuse to increase the Navy for the sake of maximizing the naval combative force. Rather it should be an opportunity to optimize the benefits obtainable from the Service through utilization of its men and other resources to the fullest potential to contribute either to defense or detente. Hopefully, initiatives by the U.S. Navy supporting the concept and functional operations of an international ocean authority will help justify an adequate allocation for defense capabilities as well as the developmental and service activities. The promise of both economic and security dividends from the national tax dollar responds to the public need and desire for more beneficial and relevant use of the nation's resources.

Does the Navy need the commitment to dual roles? The expanded activity inherent in the concept of dual roles would not so much make the Navy an oversized Coast Guard as allow the naval establishment greater means and freedom to accomplish the objectives of national security for U.S. citizens and activities on the high seas. The Navy needs the authority of world law and multilateral institutions for

problem solving in order to help manage what it is supposed to preserve and protect. The nation's right to ship oil through an international strait or to mine manganese nodules in the deep ocean ultimately depends upon the same rights being afforded all nations. Clearly, multilateral monitoring of such flag activities and enforcement of established rules is to be preferred to singular national efforts. Only an international organization having the backing of the U.S. Navy, among others could do this effectively for the community of nations. All world navies can provide examples of high standards of conduct and navigation as well as abilities in scientific research and development of new technologies. Public vessels and governmental activities need not be excluded from ocean treaties. Strict national enforcement of international laws may be subject to the international regimes comments in multinational forums or complaints in an international tribunal. The U.S. Ocean Dumping Act points in this direction [54 p. 27].

National navies and an effective international regime can be compatible on the world's oceans. Nevertheless, the Outer Space Treaty, Antarctica Treaty, Non-Proliferation Treaty, Test Ban Treaty and Seabed Disarmament Treaty have put bounds on the military activities of the world's nations. Each of these agreements was facilitated by competing technologies that made it advantageous for each nation to limit its activities. These treaties alone will not stop increasing militarization of the oceans. A credible ocean regime would

help to do so. The world's navies, however, must be given the opportunity to participate in the work of the international ocean regime.

In summary, the U.S. Navy and all navies can participate in the successful solution to each of the seven issues examined here. National security and peaceful use of the seas can be better achieved if all national navies contribute peacekeeping forces to the international regime, aid in monitoring ocean activities and exchange selected information. This should lessen the need for a broad territorial sea if navies can insure the treaty rights of nations on the high seas. The third issue might more easily be concluded if national navies by their mutual interest and persuasion can guarantee the rights and needs of all nations with regards to the international straits. Mutual enforcement, exchange of information and sharing of technology by national sea forces can help ensure equitable exploitation and preservation of marine resources. Worldwide reporting and centralized data banks supported by advanced navies like that of the United States can spread valuable information to all ocean users. The pollution issue would also be aided by joint monitoring and cooperative enforcement. The International Regime to manage the common heritage of mankind must have an at sea capability, particularly in its infancy. That capability could quickly and logically be provided by national navies. By its nature, the U.S. Navy should be one of the leaders in that task.

VI. CONCLUSIONS

A. THE INTERNATIONAL SOLUTION

The legal order governing the use of ocean space for centuries has been gradually and progressively moving towards a more structured and multilateral environment. The present regime is already crumbling. In order to meet present and future needs of users of the world's oceans, the greatest forward step, yet, is required of governments and other interests: the creation of a multipurpose international organization to manage the common heritage afforded by the sea. Technology, economics and politics have strained the laws created to ensure the ocean's orderly and efficient use. Effective laws today appear certain to be outmoded tomorrow. The speed by which technology and economics render laws obsolete is also increasing; it took hundreds of years to invalidate the concept of non-possession as the basis of the freedom of the seas. It took less than ten years to prove the 1958 Conventions on the Law of the Sea lacking in realism. Their studious approach was valuable to modern maritime law, but little accommodation was provided for the foreseeable changes that would result from science, technology, economics and politics [16 p. 6]. Better, more scientific, evaluation of marine resources would have suggested more realistic solutions for ultimate jurisdictional boundaries, and would have required unhampered marine research, wherever openly conducted with participation available to

the coastal state. From yesterday's science fiction are envisioned today's plans for submarine freighters, trans-ocean pipelines, deep sea drilling and mining, underwater manned installations and artificial floating islands. In the future, the scientist must be elevated to equal status with the lawyer in examining the desirability and second order consequences of new maritime law [33 p. 45].

The international community is now working desperately to bring the Law of the Sea up to date and, hopefully beyond. The United Nations Law of the Sea Conference, organized in December, 1973 and reconvening in July, 1974, seems destined to be either Man's greatest collective achievement or one of his most serious failures. At least two unsatisfactory scenarios can be projected for the Conference. First, the coastal states, forming a majority, might force the adoption of treaty articles that surrender much of the oceans to national jurisdiction, whether as territorial sea or economic zone. Alternatively, widespread disagreement among blocks of maritime, shelf-rich, shelf-poor and landlocked states as well as coastal and global naval powers could produce a deadlocked conference, inviting by default unilateral claims to the common heritage [48]. Hopefully, a compromise will be found between demands for broader jurisdictional boundaries and the aspirations for specific economic benefits from the seas [16 p. 5]. Developing nations, for example, want fish and/or protein and may be willing to grant the national security demands of the global naval powers in exchange for

access to such a resource [3]. In order to arrive at a broad consensus for treaty articles, a basic compromise must be reached between states favoring modest marine boundaries and those desiring more marine resources. What would constitute a broadly supported set of principles which would avoid both a surrender of the "common heritage" and conference stalemate?

A consensus of the international community seems to be forming behind the following set of guiding principles:

Maximum limit of 12 miles for breadth of the territorial sea.

'Adequate guarantees' of transit in straits used for international navigation.

'Broad coastal state control' over seabed & living resources beyond the territorial sea, with 'provision for the interests of other states & the international community in general.'

'A balancing of coastal state & international community interests' on the questions of scientific research and protection of the marine environment.

'An international regime & machinery' (UN terminology for a new international organization) for the deep seabed which will 'accommodate' consumer interests and exploiter interests to 'the desire for machinery with comprehensive powers.' [11 p. 2]

The general acceptance of these principles, however, would not guarantee a successful outcome of the Sea Conference; some provision must be made for adaptation and change to any new circumstances by a continuing, law-making or regulatory agency. At the worst an ocean regime could be built upon a series of treaties that only stipulate what most nations do not want to do anyway.

B. INTERNATIONAL OCEAN SECURITY

Whether the government of a state holds national security or natural resources as its paramount ocean interest, it must acknowledge the need for some form or forms of authority to support any peaceful and secure ocean regime. Likewise, the ocean regime must accept the legitimate, that is, peaceful or internationally lawful, use of national sea forces on the world ocean. Without security by either deterrence or enforcement, there would be no law [2 p. 96]. Yet, national security and international peace are opposite sides of the same problem, and its outcome is produced by both national and international forces, civil and military, interacting either cooperatively or hostilely. While the oceans will be neither demilitarized nor denuclearized [2 p. 100] during the next twenty years, national navies can and should be given peaceful, constructive roles by both national maritime and global ocean authorities. The cumulative manpower, equipment and experience of cooperating national sea forces can provide practical and expedient means for ocean security through their monitoring and policing of ocean activity. It is concluded that while any new ocean legal and institutional regime will affect all national navies, the navies will share and ultimately determine what this new environment will be. The future will be brighter for man and more secure for ocean passage, exploration, resource exploitation and conservation when the international ocean regime encourages peaceful uses and associates national navies in its multinational operations.

C. THE NATIONAL SOLUTION OF THE UNITED STATES

The United States Navy, due to its diversity of activities and widespread operating areas, will be the most affected by any marine regime as it evolves. It is imperative that the U.S. Navy contribute significantly to the formulation and implementation of national policies for the Law of the Sea. This means not just concentrating on issues that affect military mobility [34 p. 165] but on all the issues that will ultimately affect the usage and security of the ocean, which are the reasons for the Navy. The Navy must avoid jeopardizing national needs on the security issue in order to gain a short lived or low value victory on another issue; it must also place national interest above naval interests. Conceding extensive economic rights to coastal nations in exchange for a right to transit submerged through international straits would be an example of sacrificing a major goal for a tactical advantage.

All American marine actors, including the Navy, must be ready to adapt to any ocean legal order to which the U.S. government becomes a party. However, for the seven issues examined in this thesis, there appears to be a solution that is best for both the Navy and the country as a whole. These solutions do not conflict with the most recent ocean policy statements of the government [57 p. 826; 65; 66]. These policies include:

- A maximum territorial sea of 12 nautical miles;

- Free transit through and over international straits;

Economic rights of coastal states beyond the territorial with 200 nm the furthest conceivable extension of such rights;

Recognition of the deep ocean seabed beyond national jurisdiction as the common heritage of mankind;

International regulation of pollution standards;

The maximum freedom of scientific research;

The establishment of an international ocean regime to regulate and monitor activities on the high seas, collect revenue from and for the international community and provide for the compulsory settlement of disputes.

These policies are a responsible attempt to provide for all nations a desirable ocean order. The United States cannot expect its proposals to be accepted without change or trade-offs among issues. But others of the international community should recognize that the U.S. is strong enough to preserve what it perceives as its rights in the ocean without any broadly accepted ocean conventions [2 p. 92].

Why would the United States or any large naval power subject itself to new international Laws of the Sea which are more restrictive as to national practices or as to sharing internationally what its nationals can do alone? That raises a second question: could the United States and a few other major or strategically located powers establish and enforce throughout the world their own ocean laws? In this age of global everything; communication, transportation, technology, social movements and ideas, most nations are wrapped in an interdependent web, such that forceful coercion or gunboat diplomacy is not likely to be politically successful

or militarily efficient. Thus, law ought to be built on mutual consent, reciprocal deterrence and restraint. It is in the longer term interest of the United States to enter into negotiations within the United Nations system for an agreed Law of the Sea. An exhaustive attempt to reach, constructive yet compromise solutions must be pursued before seeking alternatives. The United States is making the effort to create with the other nations a new ocean order not because it lacks the power to defend its traditional rights on the sea, but because its best interests are advanced and secured through a world of law, international cooperation and rational management of change. Moreover, the United States, more than any society, has the influence and confidence to lead a sufficient number of other states so that, together, they could create a new and desirable ocean regime and international community. No nation can be expected to support an ocean regime that is thought to deny that nation a vital need or right. However, of all present 150 states, the United States has the most to gain from a widely accepted regime. Similarly, the nation stands to lose greatly from a chaotic legal and economic disorder, military conflict at sea and/or significant non-participation in an international regime.

Regardless of the outcomes at the UN Conference on the Law of the Sea, America's ocean oriented organizations and, in particular, the Navy and Coast Guard will certainly be more "involved" through a diversity of roles. But, if

Conference results are as the author here anticipates and a multinational ocean authority emerges, the Navy will find everywhere new opportunities of value even as it pursues old missions through, and in parallel with, the new arrangements.

Individuals performing important ocean related roles in the future will need to become increasingly familiar with the Law of the Sea as its norms, agencies and subsidiary regulations become more pervasive and intricate. It would be helpful to everyone if the nation's fishermen were more cognizant of the marine legal environment. Maritime activities will routinely require the ad hoc cooperation of teams with expertise in ocean policy, maritime law, economics, industry, science and numerous technologies.[74 p. 306]. In particular, naval officers eligible for command at sea as well as marine scientists should receive formal education in international maritime law and ocean policy studies. The Navy has already gained significantly from the education of officers as oceanography specialists, "...because they understand the aims and language of both the civilian scientist and the naval officer and can help ensure that the former's efforts are geared to the special needs of the Navy." [74 p. 305]. The Navy would benefit no less from educating officers as Law of the Sea specialists and ocean policy advisors able to assist, inform or counsel statesmen, industrialists, scientists and higher military authorities. These officers should not only come from the Judge Advocate

General Corps and Naval Oceanographers, but from the general line. For example, the U.S. Naval Postgraduate School should provide within the Oceanography curriculum for the Master's degree at least one required course on the Law of the Sea and U.S. ocean policy, with additional electives available to those desiring a minor in the field. Other selected officers should be given advanced education in ocean policy studies and international maritime law with some requirements in oceanography. Among these officers should be those who may have the opportunity to command naval activities at sea.

D. AN OVERALL COMPARISON OF POSITIONS ON THE SPECTRA

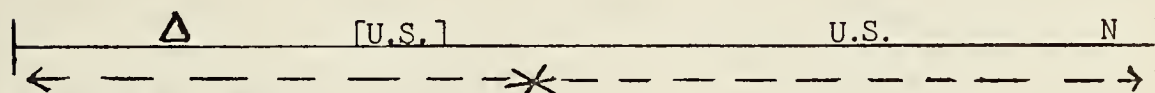
The individual scale of each of the seven separately presented spectrums treated in Section IV do not lend themselves easily to comparison. The second scales ranging from national to international jurisdiction allow at least a qualitative comparison to be made of relative positions regarding the status quo, the most likely preference for the international community and the desired position of the United States. The scale chosen places the solution affording maximum national jurisdiction to the left and that of maximum international jurisdiction to the right. In the interest of clarity and space, the specific solutions are not transposed in Figure 13. but only the relative positions as analyzed by the author from the original spectra.

If all seven spectra are viewed simultaneously several general conclusions can be drawn.. The status quo positions

(national jurisdiction) \longleftarrow \longrightarrow (international jurisdiction)



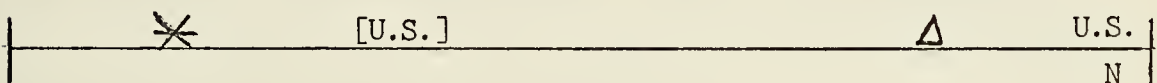
Spectrum #1: National Security and Peaceful Use of the Oceans



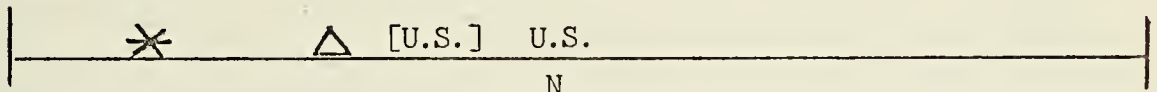
Spectrum #2: Territorial Sea



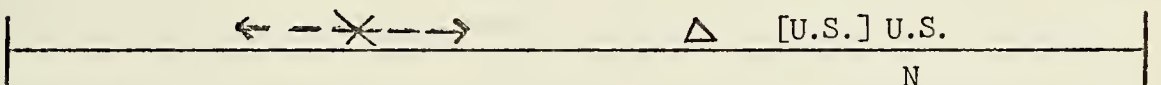
Spectrum #3: International Straits



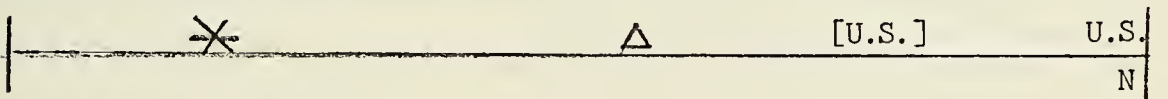
Spectrum #4: Marine Scientific Research



Spectrum #5: Marine Resources



Spectrum #6: Marine Pollution



Spectrum #7: International Regime

* legal status quo	[U.S.] recent U.S. policy
△ most likely international solution	N best solution for U.S. Navy
U.S. best solution for United States	

Figure 13: The Conglomerate Spectra

on the spectra tend to be the farthest left of all the solutions, close to the national jurisdiction end of the scale. The most likely solution by the international community is usually to the right of the status quo position thus, tending towards more international jurisdiction. Present United States policy tends to be even more to the right than the projected international position. The author's opinion of the best solution for the U.S. is either coincident with U.S. policy or further towards the international end of the spectra. The imagined best solution for the Navy is observed sometimes to be the closest to the right or associated with international jurisdiction.

Assuming that the reader finds the seven spectra and the preferred solutions approximately right, he may join the author in concluding that the United States of America, only somewhat less than its Navy, has much to gain from an ocean regime and structure more transnational than national in character. Together, the United States and its Navy should, consequently, be the staunchest and most influential supporters of such an outcome from the United Nations sponsored negotiations on the future Law of the Sea.

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(20. ABSTRACT continued)

regime.

Solutions to the issues are argued and compared from the perspectives of the international community as a whole, the United States and the U.S. Navy. It is shown that the best solutions for both the United States and its naval force appear to be in the direction of greater international jurisdiction for the world's seas, and, thus, the U.S. stands to gain the most from an effective and widely accepted international ocean regime. The roles of the U.S. Navy and other international navies as peacekeepers and marine managers supporting a new international ocean order are also explored.

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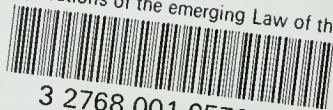
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